HAWAI'I DAIRY FARMS

~~DRAFT~~ FINAL ENVIRONMENTAL IMPACT STATEMENT

VOLUME ~~3~~ 8
COMMENTS AND RESPONSES TO THE EISPN - PART A

This environmental document is prepared pursuant to Hawai'i Revised Statutes, Chapter 343, Environmental Impact Statement Law and Chapter 200 of Title 11, Administrative Rules, Department of Health, Environmental Impact Statement Rules.

SUBMITTED BY:

Hawai'i Dairy Farms
MAHA'ULEPU, KAUA'I

~~MAY 2016~~ JANUARY 2017

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PREPARED BY:

GROUP 70 INTERNATIONAL

Architecture • Planning & Environmental Services • Interior Design • Civil Engineering
925 Bethel Street, 5th Floor, Honolulu, HI 96813 (808) 523-5866

This environmental document is prepared pursuant to Hawai'i Revised Statutes, Chapter 343, Environmental Impact Statement Law and Chapter 200 of Title 11, Administrative Rules, Department of Health, Environmental Impact Statement Rules.

~~MAY 2016~~ JANUARY 2017

FINAL ENVIRONMENTAL IMPACT STATEMENT
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VOLUME 8
COMMENTS AND RESPONSES TO THE EISPN - PART A

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A. Federal Agencies or Affiliates				
Environmental Protection Agency Region IX Pacific Islands				
Department of Agriculture Natural Resources Conservation Service	X			
Department of Commerce National Marine Fisheries Service				
Department of Homeland Security Coast Guard 14th District				
Department of Transportation Federal Aviation Administration				
Department of Transportation Federal Transit Administration				
Department of Transportation Federal Highways Administration				
Department of the Navy				
National Oceanic and Atmospheric Administration Fisheries Pacific Island Regional Office	X	X		
U.S. Army Corps of Engineers, Honolulu District	X			
U.S. Department of the Interior Fish and Wildlife Service, Pacific Islands	X	X		
Department of Interior, Geological Survey, Pacific Islands Water Science Center				
Department of the Interior National Parks Service, Pacific Islands				
B. State Agencies				
Department of Accounting and General Services	X			
Department of Agriculture	X	X		
Department of Business, Economic Development & Tourism (DBEDT)	X			
DBEDT, Office of Planning	X			
DBEDT, Strategic Industries Division	X			
Department of Hawaiian Home Lands				
Department of Land and Natural Resources (DLNR)	X	X		
DLNR, CWRM	X	X		
DLNR, Engineering Division	X	X		
DLNR, Historic Preservation Division	X	X		

Consulted Parties				
Respondents and Distribution	**Early or Ongoing Consultation, Presentation, or Notification**	**Comments Received EISPN**	**Received DEIS**	**Comments Received DEIS**
DLNR, Land Division, Kauaʻi District	X	X		
DLNR, Soil and Water Conservation District, West Kauaʻi	X			
Department of Health (DOH) via EPO	X	X		
DOH, Clean Air Branch	X	X		
DOH, Clean Water Branch	X	X		
DOH, Sanitation	X	X		
DOH, Wastewater Branch	X	X		
Department of Transportation (DOT)	X	X		
Kauaʻi/Niʻihau Island Burial Council	X			
Office of Hawaiian Affairs	X	X		
University of Hawaiʻi, Environmental Center				
University of Hawaiʻi, Water Resources Research Center				
C. County of Kauaʻi				
Department of Parks and Recreation	X			
Department of Planning	X			
Department of Public Works	X	X		
Department of Water	X	X		
Fire Department	X			
Office of Economic Development	X			
Office of the County Clerk	X	X		
Police Department	X			
Transportation Agency	X			
E. Elected Officials				
Council Chair, Mel Rapozo	X			
Council Vice Chair, Ross Kagawa	X			
Councilmember, Arryl Kaneshiro	X			
Councilmember, Gary L Hooser	X			
Councilmember, JoAnn A. Yukimura	X			
Councilmember, KipuKai Kualiʻi	X			

Consulted Parties				
Respondents and Distribution	**Early or Ongoing Consultation, Presentation, or Notification**	**Comments Received EISPN**	**Received DEIS**	**Comments Received DEIS**
Councilmember, Mason K. Chock	X			
Honorable Mayor Bernard P. Carvalho, Jr.	X			
Representative Dee Morikawa, House District 16	X			
Representative Derek S.K. Kawakami, House District 14	X			
Representative James K. Tokioka, House District 15	X			
Senator Ronald D. Kouchi, Senate District 8	X			
F. Media				
The Garden Island	X			
H. Libraries				
Department of Education Hawaiʻi State Library Hawaiʻi Documents Center				
Hawaiʻi Kai Regional Library				
Hilo Regional Library				
Kahului Regional Library				
Kaimuki Regional Library				
Kāneʻohe Regional Library				
Legislative Reference Bureau				
Library of the Department of Business, Economic Development, and Tourism				
Lihuʻe Regional Library	X			
Pearl City Regional Library				
University of Hawaiʻi Hamilton Library				
University of Hawaiʻi at Hilo Edwin H. Moʻokini Library				
University of Hawaiʻi Kauaʻi Community College Library	X			
University of Hawaiʻi, Maui College Library				
I. Community Interest Groups and Individuals				
Contractors Association Kauaʻi	X			
Friends of Māhāʻulepū	X	X		
Grove Farm	X	X		

Consulted Parties				
Respondents and Distribution	**Early or Ongoing Consultation, Presentation, or Notification**	**Comments Received EISPN**	**Received DEIS**	**Comments Received DEIS**
Hawaiʻi Chapter of the Sierra Club Kauaʻi Group	X	X		
Kauaʻi Chamber of Commerce	X			
Kauaʻi County Farm Bureau	X			
Kauaʻi Economic Development Board	X			
Kauaʻi Filipino Chamber of Commerce	X			
Kauaʻi Planning and Action Alliance	X			
Kauaʻi Visitors Bureau	X			
Kawailoa Development	X	X		
Kōloa Community Association	X			
Kōloa Landing	X			
Malama Kōloa	X			
Malama Māhāʻulepū	X	X		
Poiʻpū Beach Resort Association	X			
Poiʻpū Crater Homeowners' Association	X	X		
Poiʻpū Kai	X			
Rotary Club of Poiʻpū Beach	X			
Surfrider Foundation, Kauaʻi Chapter	X	X		
Whalers Cove Resort	X			
J. Individuals				
Albert, Martin, M.D.	X	X		
Albert, Phyllis	X	X		
Albrecht, Arnold and Jane	X	X		
Amsterdam, Jo	X	X		
Anderson, Gary R.	X	X		
Ascuena, Jodi	X	X		
Ashkenazy, Janet	X	X		
Barich, Terese	X	X		
Barnard, Bill	X	X		
Baron, Chris	X	X		
Bartlett, Tom and Mary	X	X		

Consulted Parties				
Respondents and Distribution	**Early or Ongoing Consultation, Presentation, or Notification**	**Comments Received EISPN**	**Received DEIS**	**Comments Received DEIS**
Basile, Jude	X	X		
Basler, Sabra	X	X		
Bator, Bonnie P.	X	X		
Bay, Greg & Shelley	X	X		
Beall, Charlotte and Allen	X	X		
Beam, Craig	X	X		
Bedwell, Curtis J.	X	X		
Bell, Betty	X	X		
Bell, Masai	X	X		
Blaich, Beryl	X	X		
Bishop, Roger	X	X		
Blessing, Alison K. & Breckenridge, Robert L.	X	X		
Blessing, Phillip L. and Kathleen L.	X	X		
Boll, Sharon	X	X		
Boyd, Carylee	X	X		
Boyle, Cornelia	X	X		
Brendel, Judith E.	X	X		
Britzmann, Katy	X	X		
Bulder, Liedeke & Wright, Dick	X	X		
Burkhardt, Joanne	X	X		
Burns, Mrs. Robert E.	X	X		
Carrick, George and Donna	X	X		
Cassidy, Michael and Andrea	X	X		
Caylor, Carolyn	X	X		
Cerioni, Lee	X	X		
Collison, David H. V.	X	X		
Coon, Michael M.	X	X		
Cowden, Felicia	X	X		
Crawford, Brenda S.	X	X		
Dalton, Judy	X	X		
Davis-Briant, Carol Ann	X	X		

Consulted Parties				
Respondents and Distribution	**Early or Ongoing Consultation, Presentation, or Notification**	**Comments Received EISPN**	**Received DEIS**	**Comments Received DEIS**
Decker, Lori	X	X		
DeMichiel, Catherine	X	X		
DeMichiel, Robert P.	X	X		
deVries, Diane	X	X		
DeZerega, David	X	X		
DeZerega, Sara	X	X		
Di Pietro, Jeri	X	X		
Diamant, Michael	X	X		
Dorrance, Jay	X	X		
Ebata, Ellen	X	X		
Eckberg, Ronalee and Eric	X	X		
Ellul, Beverley and Joseph	X	X		
Faraldi, Russell	X	X		
Farrell, Cheryl Ann	X	X		
Faye, Alan	X	X		
Ferguson, James & Susan	X	X		
Fleming, Collin and Factor, Kim	X	X		
Forer, Karl	X	X		
Freeman, Margery	X	X		
Goodwin, Sharon	X	X		
Grace, Yojana	X	X		
Grant, Amy	X	X		
Hadwin, Jim	X	X		
Hadwin, Kathleen	X	X		
Hagan, Beth	X	X		
Hagan, Pat	X	X		
Hagensen, Julie M.	X	X		
Hager, Vivian	X	X		
Hager, Vivian	X	X		
Halliday, John & Terri	X	X		
Hammerquist, Bridget	X	X		

Consulted Parties				
Respondents and Distribution	**Early or Ongoing Consultation, Presentation, or Notification**	**Comments Received EISPN**	**Received DEIS**	**Comments Received DEIS**
Hanohano, Kalanikumai Ka Maka ʻuli ʻuli ʻO Na Aliʻi	X	X		
Hartman, Lisa	X	X		
Hayes, Terrie and Kaohelauli'i, Billy	X	X		
Heacock, Donald E.	X	X		
Healy, John T.	X	X		
Hee, Stephen	X	X		
Heinen, Gary and Jackie	X	X		
Heller, Larry	X	X		
Hennessy, Tom and Ann	X	X		
Herndon, Herb	X	X		
Herndon, Joyce	X	X		
Hoff, John R.	X	X		
Holt, Howard & Maureen	X	X		
Houby, Jens	X	X		
Howell, David & Linda	X	X		
Hurley, Marisa	X	X		
Janai, Kapua	X	X		
Jerdal, Larry and Karen	X	X		
John, Ronald O.	X	X		
Jones, Vince and Fran	X	X		
Jorgens, Gayle and Wai, Stanley	X	X		
Judd, David	X	X		
Kashiwaeda, Suzanne	X	X		
Kawahara, Dawn Fraser	X	X		
Kawahara, Delano H.	X	X		
Kawahara, Lani	X	X		
Kechloian, Eileen	X	X		
Kechloian, John (Jay)	X	X		
Kelley, MaryLu	X	X		
Kelly, Frank and Marilyn	X	X		

Consulted Parties				
Respondents and Distribution	**Early or Ongoing Consultation, Presentation, or Notification**	**Comments Received EISPN**	**Received DEIS**	**Comments Received DEIS**
Ken (no last name)	X	X		
Kinsey, Sinclair W.	X	X		
Kuala, Marty	X	X		
Lauryn, Steven	X	X		
Lee-Jackson, Debra	X	X		
Leininger, Susan	X	X		
Levy, Joan	X	X		
Lo, Karl & Catherine	X	X		
Lucas, Paul	X	X		
Lynam, Christina	X	X		
Macdougall, Sandy	X	X		
Maple, Stuart & Lynne	X	X		
Martin, Marianne	X	X		
Masters, Jeff and Deborah	X	X		
McCaslin, Candace	X	X		
McCoubrey, Sharon	X	X		
Meboe, Ellen F.	X	X		
Meboe, Joe	X	X		
Meyer, Ira & Rayme	X	X		
Miller, John W.	X	X		
Mills, Mary P.	X	X		
Miner, Imogene	X	X		
Mizumoto, Lance C.	X	X		
Montgomery, Yuri	X	X		
Morey, Lee	X	X		
Muller, Jan	X	X		
Muller, John T. Jr.	X	X		
Murguia, Kathleen	X	X		
Neudorffer, Mary	X	X		
Norman, Rita	X	X		
O'Connor, Tim	X	X		

Consulted Parties				
Respondents and Distribution	**Early or Ongoing Consultation, Presentation, or Notification**	**Comments Received EISPN**	**Received DEIS**	**Comments Received DEIS**
Oliver, Polli C.	X	X		
Olry, Michele	X	X		
Olson, Dick and Maria	X	X		
Osterer, Lorraine	X	X		
Oxford, Patty	X	X		
Patterson, John	X	X		
Perez, Kymry	X	X		
Pescaia, Carol	X	X		
Petersen, Greg	X	X		
Pilaria, Rowland	X	X		
Pilaria, Shari	X	X		
Pilaria, Val	X	X		
Plotkins, Pierra A.	X	X		
Poindexter, James M.	X	X		
Powers, Eve	X	X		
Rachap, Allan	X	X		
Rachap, Judith	X	X		
Ray, Robert	X	X		
Rees, Gerald and Hannah	X	X		
Riley, Mark and Simpson, Ann	X	X		
Rose, Mike and Laurie	X	X		
Rosen, Gail C.	X	X		
Rosen, Henry and Sara	X	X		
Rosener, Matt	X	X		
Rozelle, Linda M.	X	X		
Rullman, Charles	X	X		
Russell, Richard	X	X		
Sauve, Joe	X	X		
Schimmelfennig, William	X	X		
Schwartz, Ken and Stephanie	X	X		
Shablow, Janette	X	X		

Consulted Parties				
Respondents and Distribution	**Early or Ongoing Consultation, Presentation, or Notification**	**Comments Received EISPN**	**Received DEIS**	**Comments Received DEIS**
Shaffer, Jamie H.	X	X		
Sherman, Dr. Irene & Douglas	X	X		
Sindt, Ed	X	X		
Smith, Stephen E.	X	X		
Snyder, Eleanor	X	X		
Sparks, Norma Doctor	X	X		
Sparks, Stephen A.	X	X		
Stecher, Steven & Igarashi, Portia	X	X		
Stein, Jerry and Wendy	X	X		
Steinhagen, James & Susan	X	X		
Sterns, Nancy	X	X		
Stone, Mary Isabella	X	X		
Stone, Rebecca	X	X		
Sullivan, Don	X	X		
Sullivan, James	X	X		
Summerfield, Yvonne	X	X		
Sussman, Jay	X	X		
Swanson, Ashley	X	X		
Swanson, William	X	X		
Talaber, Cynthia & Dave	X	X		
Taylor, Ken	X	X		
Taylor, Terry	X	X		
Thompson, Tayemi Susan	X	X		
Thurston, Anne	X	X		
Tilley, Karen	X	X		
Trapp, Max	X	X		
Trentlage, Sheri & Dave	X	X		
Trevino, Luis	X	X		
Valentini, George & Littlefield, Pam	X	X		
Valenziano, Beth	X	X		
Vlach, Robert	X	X		

Consulted Parties				
Respondents and Distribution	**Early or Ongoing Consultation, Presentation, or Notification**	**Comments Received EISPN**	**Received DEIS**	**Comments Received DEIS**
Walden, Diane	X	X		
Walden, Terry	X	X		
Waldrop, Mark	X	X		
Waldrop, Mary	X	X		
Weil, Martin	X	X		
Welti, Cynthia	X	X		
Wesland, Coni	X	X		
White, Allan B.	X	X		
Whitney, William	X	X		
Wiener, Susan	X	X		
Wilcox, Mark	X	X		
Wildman, Kelly	X	X		
Wildman, Randall	X	X		
Williams, Bob and Jeanette	X	X		
Williams, Carol	X	X		
Williams, Laura	X	X		
Wollin, Pearl	X	X		
Wolny, Kerry	X	X		
Wolny, Pam	X	X		
Wyeth, Hau'onalani	X	X		
Yeo, Gwen	X	X		
Zelkovsky, Robert	X	X		
Zimmerman, Jack	X	X		

Agencies

From: Richard Hall - NOAA Federal
To: HDF; laura.mcintyre@doh.hawaii.gov
Cc: Gerry Davis - NOAA Federal
Subject: Hawaii Dairy Farms EISPN
Date: Friday, January 30, 2015 3:21:02 PM

Jeff and Laura,

On January 27, 2015, NOAA Fisheries Pacific Islands Regional Office received a Environmental Impact Statement Preparation Notice (EISPN) for our review and comments from the planning consultant group, Group 70 International, Inc., and the approving agency, the State of Hawaii Department of Health for the Hawaii Dairy Farm project. The proposed site, which is located on the Island of Kauai, in the Koloa District, consists of 578 acres of agriculture zoned land on Mahaulepu Road.

The proposed project would establish and operate a zero-discharge, grass-fed dairy, utilizing a sustainable, pasture-based rotational grazing system. The herd size would be based on nutrient uptake by the cows, with the initial herd size limited to under 700 cows, but at full-scale operation the herd size could be as high as 2,000 cows. The primary food source for the herd would be through propagation of Kikuyu and Kikuyu-Guinea grasses which would be fertilized to promote growth by using diluted nutrient waters from the dairy's waste settling pond. The 578 acres of land used for the dairy would be divided into approximately 118 fenced paddocks (4.5 - 5.0 acres each).

As part of the project, Hawaii Dairy Farms would construct facilities for the operation, including barn and milking parlor, cow walkways, and farm roads, effluent settling and storage ponds, livestock water distribution system, storage tanks, operations buildings and an office space. The project proponent anticipates that facilities development will take approximately 10 months. Initial operations would begin with up to 699 cows, with expansion of the herd to occur over a period of several years based on performance.

According to the EISPN, the project proponent will prepare an EIS that will consider 4 alternatives: the No-Action Alternative, a Confined Dairy Alternative, an Alternative Dairy Location, and the preferred alternative described above. The EISPN also describes the Environmental Setting that would be considered in the Draft EIS. NOAA would like to offer comments specific to several of the topics listed under the Environmental Settings for you to consider while developing the Draft EIS for the Hawaii Dairy Farm project.

1. Surface Water Resources - The EISPN indicates that surface water quality is being studied and will be presented in the Draft EIS. NOAA suggest that the Draft EIS consider the possible increases in nutrients that will likely result from the dairy farm operation, and offer measures to avoid or minimize increasing nutrient load in the nearby marine environment.

2. Roadway and Traffic - The EISPN indicates that current traffic conditions, construction traffic and operational traffic will be presented in the Draft EIS. NOAA suggest that the Draft EIS consider the potential for runoff and sedimentation from the increase in impermeable surfaces that will come with this development, and include management measures that can be implemented to avoid or minimize sedimentation and runoff.

3. Drainage and Storm Water Runoff - The EISPN indicates that existing and future drainage conditions will be presented in the Draft EIS. NOAA suggest that the Draft EIS consider including management measures that will reduce sediment transport and offer measures that will avoid or minimize the runoff and discharge.

4. Water Supply - The EISPN indicates that the water system and water use will be described. NOAA suggest that the Draft EIS consider analyzing the likely changes in hydrology that may occur from the dairy operation, especially if the change results in a significant increase in fresh water being discharged into the marine environment.

NOAA would like to thank you for your efforts at early coordination and the opportunity to provide comments on the EISPN for the proposed Hawaii Dairy Farm project, and we look forward to reviewing the Draft EIS for this project when it becomes available. Feel free to contact us at your convenience if we can be of assistance in any way as you move forward with this project.

--
Richard Hall
Fishery Policy Analyst
Pacific Islands Regional Office
NOAA Inouye Regional Center
1845 Wasp Blvd., Building 176
Honolulu, HI 96818
808-725-5018

May 26, 2016

Mr. Richard Hall
Fishery Policy Analyst
Pacific Islands Regional Office
NOAA Inouye Regional Center
1845 Wasp Boulevard, Building 176
Honolulu, Hawai'i 96818

Subject: Hawai'i Dairy Farms Environmental Impact Statement (EIS) Preparation Notice
Māhā'ulepū, Kōloa District, Kaua'i, Hawai'i
Response to Comments on EISPN

Dear Mr. Hall:

Thank you for your input dated January 30, 2015 on the Hawai'i Dairy Farms (HDF) Environmental Impact Statement Preparation Notice (EISPN). We acknowledge your comments and provide the following responses.

1. Surface Water Resources. Surface water impacts were analyzed as a part of the Draft EIS report. Technical studies were conducted on both baseline water quality conditions and the potential for HDF operations to impact groundwater. The full description of process and findings is in the Draft EIS, Section 4.17, Surface Water Resources & Nearshore Marine Environment, and Appendices E and F. Analysis of potential impacts included nutrient application to the site. The pasture-based rotational grazing system focuses on growing a locally available feedstock - grass – that will provide 70 percent of more of the dairy herd's diet. Nutrient requirement for the pasture grass is greater than the nutrients available from both manure in the field and from the effluent ponds, for the committed herd size of 699 mature dairy cows. Therefore, supplemental commercial fertilizer will be required to provide sufficient nutrients to sustain the pasture grass at the site.

Cow manure deposited in the pastures will provide organic matter and release nutrients to the grass thatch and soils. Supplemented nutrients will be provided from effluent captured from the milking parlor and stored in ponds until applied to the fields. Additional commercial fertilizer will make up the nutrient requirements. Soluble nutrients will enter the pasture grass and be incorporated into the soil profile with the help of microbes and biological processes within the soil. The grass will uptake the majority of nutrients provided, with few passing through the pasture grass turf and soil profile.

The technical studies on nutrients and the hydrology of the site provide an estimate of the potential nutrient pass-through to groundwater based on projected nutrients to be applied by the dairy. The estimate assumes two percent of total nitrogen and one percent of phosphorus could potentially pass through to high level groundwater. The alluvium material that makes up the Māhā'ulepū Valley floor has poor permeability; nutrients move very slowly in groundwater. Surface water is estimated to carry three times than the nutrients in groundwater moving through the alluvium. Groundwater within the alluvium can move to surface water during wet periods when the groundwater body rises and intersects deep drainage ditches installed for sugarcane irrigation. These episodic, seasonal events will result in a modest amount of discharge from groundwater into the surface channel. Based on

evaluation of rainfall over the past 30 years, these events are calculated to be up to 10 days annually (see Section 4.17.4 and Appendix E of the Draft EIS).

Conservative calculations of the two percent nitrogen and one percent phosphorus that may pass through turf and into soils from HDF operations identifies a potential of 10,000 pounds of nitrogen and 900 pounds of phosphorus being introduced to the nearshore marine environment annually during run-off producing rainfall events.

To put the potential nutrient run-off from dairy operations into context, Section 4.20.1 Interrelationships and Cumulative Environmental Impacts compares the nutrient input from the project with input from the adjacent Kōloa-Po'ipū region. Nitrogen additions to the near-term marine environment along the Po'ipū coastline are estimated at 38,510 pounds per year from domestic wastewater and landscape fertilization, which equates to 3.5 times greater than the potential contribution from HDF; phosphorus of 1,260 pounds per year is calculated and is 1.4 times greater than the potential contribution from HDF. While the potential nutrient addition from the dairy would represent an increase from current agricultural use of Māhā'ulepū Valley, it is a fraction of the total amount of nutrients currently entering the ocean along the Po'ipū shoreline. No adverse impact to nearshore or off-shore marine waters is anticipated due to dairy operations.

Mitigation includes setbacks to minimize impacts to waterways from surface flow due to stormwater runoff will be established in keeping with the Natural Resources Conservation Service (NRCS) technical guidance and standards, as well as those established by the University of Hawai'i at Mānoa as the local land grant college. Setbacks include 35-foot buffers from the top of drainageways on both sides from which cows are excluded. These buffers will be vegetated and act as a filter strip to capture particulates during stormwater runoff events. No application of supplemental nutrients will occur within a 50-foot buffer from the top of the drainageways. Best management practices dictate suspending application of supplemental nutrients during high rainfall events.

2. Roadways and Traffic. The Hawai'i Dairy Farms facilities will occupy an area of approximately 10 acres on the western boundary of the site. The developed area "footprint" will be less than 2 percent of the total farm area. Therefore, minimal impermeable area will be created. Improvements to the site and operations will be conducted in accordance with the Conservation Plan, best management practices, and will utilize Natural Resource Conservation Service technical guidance and conservation practice standards.

3. Drainage and Stormwater. Gutters, curbs and swales will be used within the dairy facility to direct surface sheet flow as a part of the overall site storm water management plan. Metal roofing material on dairy buildings will be sloped to adequately sized gutters and downspouts. Roof run-off from the implement shed, milking parlor, and covered section of the holding yard will be discharged at ground level directly to grass surrounding the buildings. Run-off from a 1.75-acre area within the facility, primarily uncovered areas with the potential for manure,

will be routed to the storage ponds. This includes the loading area, the uncovered part of the holding yard, calving shed roofs, and the area immediately surrounding the effluent ponds. The pond edge will be above grade to prevent run-off from outside areas from entering the ponds.

A Stormwater Pollution Prevention Plan (SWPPP) has been developed for the site to document controls and best management practices to avoid, control, and trap potential erosion associated with construction activities. The SWPPP is required as part of the application for the NPDES – Construction Stormwater General Permit, and specifies any discharge in compliance with relevant regulations.

Over the long-term, the surface water quality will be improved by active management of the dairy site. Cultivation of a grass thatch for complete vegetative cover throughout the dairy paddocks will capture and utilize rainfall, and improved soil tilth will increase water infiltration.

Fences will be erected along the 35-foot setbacks to exclude cows from the buffer areas; vegetation along the buffer will trap soil particles and organic debris in order to minimize inputs to stormwater runoff. Vegetation in and adjacent to the ditches will be maintained to control overgrowth and minimize ditch bank soil erosion.

4. Water Supply. Long-term groundwater supply impacts are not anticipated to be significant. Once fully operational, the dairy will utilize 30,000 gallons per day of groundwater from on-site wells for potable uses: livestock water; and sanitation in the milking parlor. The demands of approximately 30,000 gallons per day (0.03 MGD) for potable water for the 699 mature cows and 84,800 gallons per day (0.08 MGD) for the contemplated herd size of up to 2,000 mature cow are both well within the capacity of the existing onsite Māhāʻulepū 14 well which produced 3 MGD during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

Long-term groundwater supply impacts are not anticipated to be significant. The shallow groundwater aquifer underlying the dairy farm property is a separate waterbody in clay alluvium deposits and is not connected to the deep water aquifer in unweathered volcanic rock. An assessment determined there is no hydrologic connection between the aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Thus nutrients added by the dairy operation will have no impacts to the County drinking water well and potable water within the deep volcanics.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawaiʻi Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,
GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

cc: Hawai'i Dairy Farms
Hawai'i State Department of Health,
Environmental Planning Office

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122
Honolulu, Hawai`i 96850

In Reply Refer To:
2015-TA-0138

Jeffrey H. Overton
Group 70 International, Inc.
925 Bethel Street, Fifth Floor
Honolulu, Hawaii 96813

Subject: Technical Assistance for the Proposed Hawaii Dairy Farms, Kauai

Dear Mr. Overton:

The U.S. Fish and Wildlife Service (Service) received your letter, dated January 26, 2015, requesting our comments on the Notice of Preparation of Environmental Impact Statement (EISPN) for the proposed Hawaii Dairy Farms (HDF) on the island of Kauai. Hawaii Dairy Farms, LLC proposes to establish and operate a grass-fed diary, capable of supporting 2,000 dairy cows, including commercial dairy facilities and pastures managed for Kikuyu and Kikuyu-Guinea grasses. The proposed dairy facilities consist of barn and milking parlor, cow walkways, farm roads, effluent settling and storage ponds, water distribution system and tanks, operations buildings, and associated infrastructure (electrical power, wastewater, and communications). The pasture design will include approximately 118 fenced paddocks (~4.5 to 5.0 acres each). The development will be located on approximately 578 acres consisting of portions of three larger parcels (TMK (4) 2-9-003:001 and 006 portion; TMK (4) 2-9-001:001) adjacent to Mahaulepu Road, east of Koloa town. We offer the following comments to assist you in the preparation of the draft Environmental Impact Statement (EIS). Our comments are provided under the authorities of the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C 1531 *et seq.*), and the Fish and Wildlife Coordination Act of 1934 (FWCA), as amended (16 U.S.C. 661 *et seq.*; 48 Stat. 401).

We reviewed the information you provided and pertinent information in our files, including data compiled by the Hawaii Biodiversity and Mapping Program, as it pertains to federally listed species and designated critical habitat. The following species are known to occur or transit through the proposed project area: the endangered Hawaiian black-necked stilt (*Himantopus mexicanus knudseni)*, Hawaiian moorhen (*Gallinula chloropus sandvicensis*), Hawaiian coot (*Fulica alai*), Hawaiian duck (*Anas wyvilliana*) (hereafter collectively referred to as Hawaiian waterbirds);the endangered Hawaiian goose (*Branta sandvicensis*); the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus)*; and the endangered Hawaiian petrel (*Pterodroma sandwichensis*), the threatened Newell's shearwater (*Puffinus auricularis newelli*), and a candidate for listing the band-rumped storm-petrel (*Oceanodroma castro*) (hereafter collectively referred to as seabirds). The proposed project area is in the vicinity of designated critical habitat

for the following species: two endangered arthropods, the Kauai cave wolf spider (*Adelocosa anops*) and the Kauai cave amphipod (*Spelaeorchestia koloana*) (hereafter collectively referred to as arthropods); and an endangered plant, ohai (*Sesbania tomentosa*). We provide the following comments which include recommendations to avoid and minimize project impacts to listed species, candidate species, and critical habitat.

Hawaiian Waterbirds and Hawaiian Goose
The EISPN states that Hawaiian waterbirds and Hawaiian geese are known to utilize water features around the HDF parcel. Our information suggests that considerable numbers of Hawaiian waterbirds frequent the project area. The Service recommends you incorporate the following measures into your project description to avoid and minimize impacts to Hawaiian waterbirds and Hawaiian geese.

Waterbirds and geese may be attracted to the effluent settling and storage ponds as well as managed pastures. Waterbirds and geese attracted to sub-optimal habitat may suffer adverse impacts, such as predation and/or reduced reproductive success, and thus the project may create an attractive nuisance. Measures to minimize their attraction to ponds, such as covering or enclosing the ponds, should be considered. To minimize predation and/or reduced breeding success of waterbirds and geese using pastures, a predator control program should be implemented to control non-native predators, such as feral cats and rats.

Injury or mortality of adults and juveniles may potentially occur due to entanglement or collision with fencing and/or collision with vehicles on farm roads. Additional details on fencing are necessary to assess potential impacts to Hawaiian waterbirds and Hawaiian geese. Electric fencing (commonly used to control movement of cows in pastures) should not be used for fencing as part of the proposed project. To minimize potential collision with vehicles, the Service recommends you install signage near roadways to warn drivers (e.g., farm workers and visitors) to be wary of birds in the areas.

Under certain environmental conditions, *Clostridium botulinum*, a bacteria commonly occurring in nutrient-rich substrate, may produce toxins that when ingested by Hawaiian waterbirds or Hawaiian geese results in paralysis and most often mortality (referred to as avian botulism). The EISPN states that 100% of manure from up to 2,000 dairy cows will be treated and applied to fertilize pasture grasses. The spraying of pastures with decaying animal materials will promote a nutrient-rich bacterial substrate. We recommend you work with our office so that we may assist you in developing measures to avoid fostering conditions that promote avian botulism and a monitoring plan for early detection and response.

Displacement and/or loss of nests may potentially occur during project construction and operation (e.g., clearing areas, disking, and/or mowing of pastures). To minimize and avoid impacts due to displacement and/or loss of nests, we recommend the following measures:

- A biological monitor should conduct Hawaiian waterbird and Hawaiian goose nest surveys at the proposed project site prior to project initiation.
- Any documented nests or broods within the project vicinity should be reported to the Service within 48 hours.

- A 100-foot buffer should be established and maintained around all active nests and/or broods until the chicks have fledged. No potentially disruptive activities or habitat alteration should occur within this buffer.
- The Service should be notified immediately prior to project initiation and provided with the results of pre-construction Hawaiian waterbird and Hawaiian goose surveys.
- A biological monitor(s) should be present on the project site during all construction activities, earth moving activities, land clearing/disking activities, and mowing of pastures to ensure that waterbirds or geese nests are not adversely impacted.
- If a Hawaiian waterbird or Hawaiian goose is observed within the project site, or flies into the site while activities are occurring, the biological monitor should halt all activities within 100 feet of the individual(s). Work should not resume until the Hawaiian waterbird(s) or goose leave the area on their own accord.
- A post-construction report should be submitted to the Service with 30 days of the completion of the project. The report should include the results of surveys, the location and outcome of documented nests, and any other relevant information.

We suggest the draft EIS provide additional information on effluent ponds (e.g., number, location, and sizes), fencing materials and site layout, fertilization practices (e.g., effluent treatment, application amounts, frequency), outline measures to avoid and minimize the various potential impacts described above, and examine potential impacts that may occur as a result of establishment and operation of the HDF project.

Hawaiian Hoary Bat
The Hawaiian hoary bat roosts in both exotic and native woody vegetation and, while foraging, will leave young unattended in "nursery" trees and shrubs when they forage. If trees or shrubs suitable for bat roosting are cleared during the breeding season, there is a risk that young bats could inadvertently be harmed or killed. To minimize impacts to the endangered Hawaiian hoary bat, woody plants greater than 15 feet (4.6 meters) tall should not be disturbed, removed, or trimmed during the bat birthing and pup rearing season (June 1 through September 15). Site clearing should be timed to avoid disturbance to Hawaiian hoary bats in the project area.

Additionally, Hawaiian Hoary bats forage for insects from as low as three feet to higher than 500 feet above the ground. When barbed wire is used for fencing, Hawaiian hoary bats can become entangled. Barbed wire should not be used for fencing as part of the proposed project.

Seabirds
Seabirds, including the Newell's shearwater, Hawaiian petrel, and band-rumped storm petrel fly at night and are attracted to artificially-lighted areas resulting in disorientation and subsequent fallout due to exhaustion. Seabirds are also susceptible to collision with objects that protrude above the vegetation layer, such as utility lines, guy-wires, and communication towers. Additionally, once grounded, they are vulnerable to predators and are often struck by vehicles along roadways. We recommend the following minimization measures be incorporated into your project description:

- Construction activities should only occur during daylight hours. Any increase in the use of nighttime lighting, particularly during peak fallout period (September 15 through December 15), could result in additional seabird injury or mortality.

- If exterior facility lights cannot be eliminated due to safety or security concerns, then they should be positioned low to the ground, be motion-triggered, and be shielded and/or full cut-off. Effective light shields should be completely opaque, sufficiently large, and positioned so that the bulb is only visible from below.

The draft EIS should examine potential impacts to the Newell's shearwater, Hawaiian petrel, and band-rumped storm petrel that may occur as a result of construction and the operational use exterior lights associated with the proposed project.

Utility poles and overhead lines may constitute a collision hazard for seabirds as they traverse between the ocean and their breeding colonies. Additional information on the design of the proposed utility system for the development, including the number of utility poles, length of powerline, configuration of powerlines, and height of utility poles and overhead powerlines, in the area is necessary to assess the potential impacts to seabirds. We suggest the draft EIS provide this additional informational as well as determine whether undergrounding power lines in the proposed development area is feasible to avoid impacts to seabirds. If it is not feasible to underground power lines or install power lines at or the below the vegetation layer, other measures to minimize the potential for seabird collision should be analyzed in the draft EIS (e.g., vertical versus horizontal arrays, etc.).

Arthropods
The Kauai cave wolf spider and the Kauai cave amphipod are found only on the island of Kauai in the Koloa area from four to six caves respectively. They occur in small, subterranean spaces, voids, and cracks, requiring a woody debris food source. Cave ecosystems are threatened by contamination from surface sources of toxic chemicals from spills, pesticides, and waste disposal which enter caves via streams and/or ground-water seepage. The proposed HDF site is hydrologically linked to the sensitive cave habitats. We recommend the draft EIS address any project components that have the potential to impact the critical habitat (e.g., wastewater and pasture fertilization practices) and minimize potential disturbance.

Sesbania tomentosa
Sesbania tomentosa occurs on the coast located southeast of the HDF site. The primary threat to the species on the island of Kauai is habitat degradation caused by competition with various introduced plant species, including but not limited to buffelgrass (*Cenchrus ciliaris*), swollen fingergrass (*Chloris barbarta*), sourgrass (*Digitaria insularis*), and haole koa (*Leucaena leucocephala*). Other threats include lack of adequate pollination, fire, destruction by off-road vehicles, other human disturbances, and storms. The Service recommends that your draft EIS address any project components that have the potential to impact the critical habitat and minimize potential disturbance.

Under the ESA, take is defined to mean "...to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct." Harass is defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Harm is defined by the

Service to include significant habitat modification or degradation that results in death or injury to listed species by impairing behavioral patterns including breeding, feeding, or sheltering.

When additional information on the proposed project description becomes available, we recommend you contact our office early in the planning process so that we may further assist you with ESA compliance. If it is determined that the proposed project may affect federally listed species or critical habitat, the project proponent(s) should coordinate with us under section 10 of the ESA or consult with us pursuant to section 7 of the ESA as follows. If the proposed project is funded, authorized, or permitted by a Federal agency, then that agency should consult with us pursuant to section 7(a)(2) of the ESA. If no Federal agency is involved with the proposed project, the applicant should apply for an incidental take permit under section 10(a)(1)(B) of the ESA. A section 10 permit application must include a habitat conservation plan that identifies the effects of the action on listed species and their habitats, and defines measures to minimize and mitigate those adverse effects.

Additionally, we recommend you incorporate the attached best management practices into your project description to avoid and minimize impacts to water resources that have the potential to occur during establishment and construction of the proposed project.

We appreciate your efforts to conserve protected species. If you have questions regarding this letter, please contact Adam Griesemer, Endangered Species Biologist (phone: 808-285-8261).

Sincerely,

Aaron Nadig
Island Team Manager
Oahu, Kauai, North Western Hawaiian Islands, and American Samoa

cc: Laura McIntyre, HDOH

U.S. Fish and Wildlife Service
Recommended Standard Best Management Practices

The U.S. Fish and Wildlife Service (USFWS) recommends the following measures to be incorporated into project planning to avoid or minimize impacts to fish and wildlife resources. Best Management Practices (BMPs) include the incorporation of procedures or materials that may be used to reduce either direct or indirect negative impacts to aquatic habitats that result from project construction-related activities. These BMPs are recommended in addition to, and do not over-ride any terms, conditions, or other recommendations prepared by the USFWS, other federal, state or local agencies. If you have questions concerning these BMPs, please contact the USFWS Aquatic Ecosystems Conservation Program at 808-792-9400.

1. Authorized dredging and filling-related activities that may result in the temporary or permanent loss of aquatic habitats should be designed to avoid indirect, negative impacts to aquatic habitats beyond the planned project area.

2. Dredging/filling in the marine environment should be scheduled to avoid coral spawning and recruitment periods, and sea turtle nesting and hatching periods. Because these periods are variable throughout the Pacific islands, we recommend contacting the relevant local, state, or federal fish and wildlife resource agency for site specific guidance.

3. Turbidity and siltation from project-related work should be minimized and contained within the project area by silt containment devices and curtailing work during flooding or adverse tidal and weather conditions. BMPs should be maintained for the life of the construction period until turbidity and siltation within the project area is stabilized. All project construction-related debris and sediment containment devices should be removed and disposed of at an approved site.

4. All project construction-related materials and equipment (dredges, vessels, backhoes, silt curtains, etc.) to be placed in an aquatic environment should be inspected for pollutants including, but not limited to; marine fouling organisms, grease, oil, etc., and cleaned to remove pollutants prior to use. Project related activities should not result in any debris disposal, non-native species introductions, or attraction of non-native pests to the affected or adjacent aquatic or terrestrial habitats. Implementing both a litter-control plan and a Hazard Analysis and Critical Control Point plan (HACCP – see *http://www.haccp-nrm.org/Wizard/default.asp*) can help to prevent attraction and introduction of non-native species.

5. Project construction-related materials (fill, revetment rock, pipe, etc.) should not be stockpiled in, or in close proximity to aquatic habitats and should be protected from erosion (*e.g.*, with filter fabric, etc.), to prevent materials from being carried into waters by wind, rain, or high surf.

6. Fueling of project-related vehicles and equipment should take place away from the aquatic environment and a contingency plan to control petroleum products accidentally spilled during the project should be developed. The plan should be retained on site with the person responsible for compliance with the plan. Absorbent pads and containment booms should be stored on-site to facilitate the clean-up of accidental petroleum releases.

7. All deliberately exposed soil or under-layer materials used in the project near water should be protected from erosion and stabilized as soon as possible with geotextile, filter fabric or native or non-invasive vegetation matting, hydro-seeding, etc.

GROUP 70
INTERNATIONAL

PRINCIPALS

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OF COUNSEL

Ralph E. Portmore FAICP
Hitoshi Hida AIA

May 26, 2016

Mr. Aaron Nadig
Island Team Manager
Oahu, Kaua'i, North Western Hawaiian Islands and American Samoa
United States Department of the Interior
Fish and Wildlife Service
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122
Honolulu, Hawai'i 96850

Subject: Hawai'i Dairy Farms Environmental Impact Statement (EIS) Preparation Notice
Māhā'ulepū, Kōloa District, Kaua'i, Hawai'i
Response to Comment on EISPN

Dear Mr. Nadig:

Thank you for your input dated February 23, 2015 on the Hawai'i Dairy Farms Environmental Impact Statement Preparation Notice (EISPN). We acknowledge your comments and offer the following responses.

Background research and field surveys conducted by Rana Biological Consulting and AECOS Consultants for Hawai'i Dairy Farms (HDF) are contained in Appendix A of the Draft EIS, and include complete species lists for both flora and fauna observed. Minimization and mitigation measures to reduce impacts to federally protected fauna that may transit or utilize the HDF site are included in Section 4.10, Fauna.

As an agricultural project on private lands using private funding, HDF is committed to making a positive impact on food sustainability as well as being a good steward of the land. The dairy's proposed agricultural actions are guided by technical standards and practices of the National Resources Conservation Service (NRCS). HDF retained a qualified NRCS technical service provider to prepare a Conservation Plan for the project, which was approved by the West Kaua'i Soil and Water Conservation District in December 2013. The self-governing soil and water conservation districts are legally constituted sub-units of the Hawai'i state government and are guided by unpaid volunteers who contribute their time and effort to preserve natural resources and enhance the quality of life in their communities. HDF will utilize standards and technical guidance from NRCS and maintain dialogue with the West Kaua'i Soil and Water Conservation District.

Critical habitats for endangered species exist within the Kōloa-Po'ipū area, but do not extend to the HDF site located in the upper Māhā'ulepū Valley. Various protected seabird species may overfly the site; the endangered Hawaiian hoary bat may transit the property. No threatened or endangered flora exists on the site, which has been in commercial sugarcane cultivation since 1878.

Following are responses to the specific comments in your letter.

1. Hawaiian Waterbirds and Hawaiian Goose. There is no critical habitat for any endangered waterbird species or nēnē at the HDF site. Nēnē nest in the general Kōloa area, and habitat present on parts of the HDF site is suitable for nesting as nēnē may utilize areas far from water if adequate ground cover vegetation is present. Hawaiian waterbirds and the Hawaiian goose (nēnē) have been observed on the HDF site. Section 4.10 of the Draft EIS describes existing conditions.

Measures will be adopted to avoid and minimize potential effects to seabirds and nēnē from fences and structures. Fencing is discussed in Section 3.5.1 of the Draft EIS. A perimeter fence will be constructed of 42-inch hog wire topped with a strand of straight wire at 48-inch height. Barbed wire will be secured at ground level to deter rooting and entry by feral pigs. Interior paddock fencing will consist of two or three strands of electric wire mounted on wooden t-posts. Electric fences are more effective than wire fences at keeping cattle within paddocks. Fence design and construction will follow NRCS practice codes for the Pacific Islands Region.

Construction activities such as clearing and grubbing have the potential to disturb nesting waterbirds, nests, eggs, and young. A qualified biologist will survey for nesting waterbirds and nēnē prior to and during construction. For ongoing operations, HDF will develop an Avian Species Protection Plan (APP) to include mitigation measures and methods to avoid impacts to waterbirds and nēnē. These measures will include recognition of field conditions that could promote avian botulism, and methods to counteract such potential conditions. Hawai'i Dairy Farms will provide endangered species awareness training to contractors and employees related to both construction and dairy operations. Speed limits will be posted and enforced on the dairy site.

Potential measures to protect endangered birds from collisions during construction include lowering cranes at night, marking tall structures and fencing with white visibility polytape, limiting nighttime lighting, and shielding outside lights. The full list of construction mitigation measures to be implemented is presented in EIS Section 4.10.

Effluent ponds will be surrounded by non-vegetated surfaces which are not expected to provide appropriate cover for nesting birds. Should birds be attracted to the effluent ponds, HDF will cover the ponds.

3. Hawaiian Hoary Bat. It is likely that Hawaiian hoary bats overfly the project area on a seasonal basis. Potential impacts to bats from development typically occur during the clearing and grubbing phases of construction where mature vegetation is removed. At the HDF site, there are no suitable roost trees. Entanglement of bats with fencing will be negated by only using a single strand of barbed wire at ground level to deter feral pigs. No impacts to bats are expected.

4. Seabirds. Seabirds that nest in upland areas of Kaua'i may overfly the site. In keeping with best management practices, outside lights used at night will be shielded to prevent uplighting and possible disorientation of seabirds.

5. Arthropods. A study of invertebrate species and pest insects was conducted in January 2016 by Steven Lee Montgomery, PhD, Consulting Biologist. The entire study is included in DEIS Appendix B. There are no known caves or lava tubes found at or adjacent to the dairy farm property. The Kōloa Lava Tube System, which provides habitat for two endemic cave species, the Kaua'i Cave Wolf Spider and the Kaua'i Cave amphipod, is located several miles away from the dairy farm property. Both invertebrates are listed as endangered under the U.S. Endangered Species Act. Not all caves in the Kōloa area contain these invertebrates, as most caves in the Kōloa District do not contain the optimal climatological conditions required by these organisms.

A groundwater engineer determined that the HDF site has no hydrologic connection to the deep volcanic series lavas. Neither the botanical and faunal survey nor the invertebrate survey revealed any evidence of lava tubes or caves on the property, and no such features have been reported for the area near the HDF site. Thus no cave invertebrate species will be affected by the dairy farm.

6. Endangered Plant - *Sebania tomentosa.* Critical Habitat for the endangered 'ohai (*Sesbania tomentosa*) has been designated along the entire Māhā'ulepū shoreline. 'Ohai is typically found in dry, coastal areas below 2,500 feet elevation, though on Kaua'i, 'ohai is known from only one population in the Polihale State Park area. No suitable habitat for the 'ohai plant exists on the dairy site.

HDF acknowledges the concern of introduced plant species on native habitats. Vegetation on the site is typical of regularly disturbed lowland areas; during a survey of the site's flora and fauna, only five indigenous species were found among the 115 plant species identified, representing only 4.3 percent of the species on site (EIS Section 4.9.1). Swollen fingergrass, *Digitaria insularis*, and haole koa are among the weeds identified on site during the survey. A primary project objective is to grow nutritious grass for dairy cows; Kikuyu (*Pennisetum clandestinum*) will be the dominant grass for the pasture. Native plants with potential to stabilize banks will be encouraged and supplemented as needed to develop vegetated buffer strips 35-feet wide along drainages as part of the Conservation Plan to reduce erosion and stabilize slopes. No long-term impacts to native plant habitats or endangered or threatened plants species will occur as a result of the dairy.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,
GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

cc: Hawai'i Dairy Farms
Hawai'i State Department of Health,
Environmental Planning Office

From: Kauanoe.M.Hoomanawanui@hawaii.gov
Sent: Monday, February 02, 2015 8:02 AM
To: HDF; laura.mcintyre@doh.hawaii.gov
Cc: Mauna Kea Trask; kyap@gayandrobinson.com
Subject: Kauai Niihau Island Burial Council Consultation

Follow Up Flag: Follow up
Flag Status: Flagged

Aloha e Jeff & Laura,

We have received correspondence regarding Hawaii Dairy Farms; Notice of Preparation of Environment Impact Statement and would like the opportunity to make comment through the commissions process. Our next scheduled Kaua'i Niihau Island Burial Council meeting is scheduled for February 18, 2015 to be held at the DOT- Conference here in Puhi, Kaua'i Island beginning at 9 am.

Please let me know if you are able to present the mitigation measures associated with HDF agricultural operations at Maha'ulepu, Kaua'i.

Should you have any questions or concerns please contact myself or the cc'd KNIBC Chairperson Keith Yap and Vice Chairperson Mauna Kea Trask.

Ahui Hou,

Kauanoe M Hoomanawanui
Burial Sites Specialist
State of Hawaii
Department of Land and Natural Resources
Historic Preservation Division
P.O.Box 1729
Lihue, HI 96766

cel: (808) 896-0475
email: Kauanoe.M.Hoomanawanui@hawaii.gov

"iwi o kuu iwi koko o kuu koko pili ka moo a mau loa"

GROUP 70 INTERNATIONAL

May 26, 2016

Ms. Kauanoe M. Hoomanawanui
Burial Sites Specialist
State of Hawai'i
Department of Land and Natural Resources
Historic Preservation Division
P.O. Box 1729
Līhu'e, Hawai'i 96766

Subject: Hawai'i Dairy Farms Environmental Impact Statement (EIS) Preparation Notice
Māhā'ulepū, Kōloa District, Kaua'i, Hawai'i
Response to Comment on EISPN

Dear Ms. Hoomanawanui:

Thank you for your input dated February 2, 2015 on the Hawai'i Dairy Farms Environmental Impact Statement Preparation Notice (EISPN).

1. EIS Review Process. We appreciate SHPD's assistance on this project and acknowledge that the State Historic Preservation Division (SHPD) would like the opportunity to comment on the project. The Hawai'i Dairy Farms project is subject to a historic preservation review by the State Department of Land and Natural Resources, SHPD under HRS Chapter 6E and Chapter 13-284.

2. Archaeological Inventory Survey and Cultural Impact Assessment. An Archaeological Inventory Survey (AIS) and a Cultural Impact Assessment were conducted for the proposed project. Sixteen historic properties were identified, six of which are onsite and associated with sugarcane era plantation. Of the 10 historic sites found in an extended survey area 1,000 feet north of the project area, one newly identified site is believed to be associated with pre-Contact or early historic times. The survey relocated a previously identified pre-contact pohaku with petroglyphs, two pecked cups, and a long etched groove.

None of the sixteen sites will be adversely affected by the proposed project, but safeguards will be in place. Two of the sixteen sites have been evaluated as significant under multiple criteria, but both occur outside the project area. No burial sites were found and sites outside of the project area will not be affected. Should there be potential resources of concern which require advisory by the Kaua'i Ni'ihau Island Burial Council, the appropriate procedures will be followed.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,
GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

cc: Hawai'i Dairy Farms
Hawai'i State Department of Health,
Environmental Planning Office

DAVID Y. IGE
GOVERNOR OF HAWAII

CARTY S. CHANG
ACTING CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

FIRST DEPUTY

WILLIAM M. TAM
INTERIM DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

January 26, 2015

MEMORANDUM

TO: **DLNR Agencies:**
X Div. of Aquatic Resources
__Div. of Boating & Ocean Recreation
X Engineering Division
X Div. of Forestry & Wildlife
__Div. of State Parks
X Commission on Water Resource Management
X Office of Conservation & Coastal Lands
X Land Division – Kauai District
X Historic Preservation

RECEIVED
LAND DIVISION
2015 FEB -4 AM 10:42
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

FROM: Russell Y. Tsuji, Land Administrator
SUBJECT: Hawai'i Dairy Farms, Notice of Preparation of Environmental Impact Statement
LOCATION: Island of Kauai, Koloa District, Tax Map Key(s): (4) 2-9-003: 001 (portion) & 006 (portion); (4) 2-9-001:001 (portion)
APPLICANT: Hawai'i Dairy Farms, LLC, by its planning consultant Group 70 International, Inc.

Transmitted for your review and comment on the above-referenced document. We would appreciate your comments on this document which can be found here:

1. Go to: https://sp01.ld.dlnr.hawaii.gov/LD
2. Login: Username: LD\Visitor Password: 0pa$$word0 (first and last characters are zeros)
3. Click on: Requests for Comments. Click on the subject file "Hawai'i Dairy Farms, Notice of Preparation of Environmental Impact Statement", then click on "Files" and "Download a copy". (Any issues accessing the document should be directed to Jonathan Real, Applications/Systems Analyst at 587-0427 or Jonathan.C.Real@hawaii.gov)

Please submit any comments by February 18, 2015. If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Supervising Land Agent Steve Molmen at (808) 587-0439. Thank you.

Attachments

( ) We have no objections.
(X) We have no comments.
( ) Comments are attached.

Signed:
Print Name: MARVIN MIKASA
Date: 2/2/15

DAVID Y. IGE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

CARTY S. CHANG
INTERIM CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

DANIEL S. QUINN
INTERIM FIRST DEPUTY

W. ROY HARDY
ACTING DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

February 19, 2015

Group 70 International, Inc.
Attn: Jeff Overton, Principal Planner
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813-4307

via email: HDF@Group70int.com

State of Hawaii, Department of Health
Environmental Planning Office
Attn: Laura McIntyre, Program Manager
919 Ala Moana Boulevard, Rm. 312
Honolulu, Hawaii 96814

via email: Laura.McIntyre@doh.hawaii.gov

Dear Mr. Overton and Ms. McIntyre,

SUBJECT: Hawai'i Dairy Farms, Notice of Preparation of Environmental Impact Statement

Thank you for the opportunity to review and comment on the subject matter. The Department of Land and Natural Resources' (DLNR) Land Division distributed or made available a copy of your report pertaining to the subject matter to DLNR Divisions for their review and comments.

At this time, enclosed are comments from (1) Land Division – Kauai District; and (2) Engineering Division. No other comments were received as of our suspense date. Should you have any questions, please feel free to call Supervising Land Agent Steve Molmen at 587-0439. Thank you.

Sincerely,

Russell Y. Tsuji
Land Administrator

Enclosure(s)

GROUP 70
INTERNATIONAL

PRINCIPALS

Francis S. Oda, Arch.D., FAIA, AICP, LEED AP
Norman G.Y. Hong AIA
Sheryl B. Seaman AIA, ASID, LEED AP
Roy H. Nihei AIA, CSI, LEED AP
James I. Nishimoto AIA
Stephen Yuen AIA
Linda C. Miki AIA
Charles Y. Kaneshiro AIA, LEED AP
Jeffrey H. Overton AICP, LEED AP
Christine Mendes Ruotola AICP, LEED AP
James L. Stone, Arch.D., AIA, LEED AP
Katherine M. MacNeil AIA, LEED AP
Tom Young, MBA AIA
Paul T. Matsuda PE, LEED AP
Ma Ry Kim RIBA, ARB
Craig Takahata AIA

OF COUNSEL

Ralph E. Portmore FAICP
Hitoshi Hida AIA

May 26, 2016

Mr. Russell Y. Tsuji
Land Administrator
State of Hawai'i
Department of Land and Natural Resources
Post Office Box 621
Honolulu, Hawaii 96809

Subject: Hawai'i Dairy Farms Environmental Impact Statement (EIS) Preparation Notice
Māhā'ulepū, Kōloa District, Kaua'i, Hawai'i
Response to Comment on EISPN

Dear Mr. Tsuji:

Thank you for your input dated January 26, 2015 on the Hawai'i Dairy Farms Environmental Impact Statement Preparation Notice (EISPN). We acknowledge that the Land Division – Kaua'i District has no comments at this time.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,
GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

cc: Hawai'i Dairy Farms
Hawai'i State Department of Health,
Environmental Planning Office
Steve Molmen – Supervising Land Agent, Kaua'i District

DAVID Y. IGE
GOVERNOR OF HAWAII

CARTY S. CHANG
INTERIM CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

DANIEL S. QUINN
INTERIM FIRST DEPUTY

W. ROY HARDY
ACTING DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

February 19, 2015

Group 70 International, Inc. via email: HDF@Group70int.com
Attn: Jeff Overton, Principal Planner
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813-4307

State of Hawaii, Department of Health
Environmental Planning Office
Attn: Laura McIntyre, Program Manager via email: Laura.McIntyre@doh.hawaii.gov
919 Ala Moana Boulevard, Rm. 312
Honolulu, Hawaii 96814

Dear Mr. Overton and Ms. McIntyre,

SUBJECT: Hawai'i Dairy Farms, Notice of Preparation of Environmental Impact Statement

Thank you for the opportunity to review and comment on the subject matter. The Department of Land and Natural Resources' (DLNR) Land Division distributed or made available a copy of your report pertaining to the subject matter to DLNR Divisions for their review and comments.

At this time, enclosed are comments from (1) Land Division – Kauai District; and (2) Engineering Division. No other comments were received as of our suspense date. Should you have any questions, please feel free to call Supervising Land Agent Steve Molmen at 587-0439. Thank you.

Sincerely,

Russell Y. Tsuji
Land Administrator

Enclosure(s)

DAVID Y. IGE
GOVERNOR OF HAWAII

CARTY S. CHANG
ACTING CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

FIRST DEPUTY

WILLIAM M. TAM
INTERIM DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
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LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

January 26, 2015

MEMORANDUM

TO: PR.

DLNR Agencies:
X Div. of Aquatic Resources
__Div. of Boating & Ocean Recreation
X Engineering Division
X Div. of Forestry & Wildlife
__Div. of State Parks
X Commission on Water Resource Management
X Office of Conservation & Coastal Lands
X Land Division – Kauai District
X Historic Preservation

DEPT. OF LAND & NATURAL RESOURCES STATE OF HAWAII 2015 FEB 18 PM 2:54

'15 JAN 27 PM 12:30 ENGINEERING RECEIVED LAND DIVISION

FROM: TO: Russell Y. Tsuji, Land Administrator
SUBJECT: Hawai'i Dairy Farms, Notice of Preparation of Environmental Impact Statement
LOCATION: Island of Kauai, Koloa District, Tax Map Key(s): (4) 2-9-003: 001 (portion) & 006 (portion); (4) 2-9-001:001 (portion)
APPLICANT: Hawai'i Dairy Farms, LLC, by its planning consultant Group 70 International, Inc.

Transmitted for your review and comment on the above-referenced document. We would appreciate your comments on this document which can be found here:

1. Go to: https://sp01.ld.dlnr.hawaii.gov/LD
2. Login: Username: LD\Visitor Password: 0pa$$word0 (first and last characters are zeros)
3. Click on: Requests for Comments. Click on the subject file "Hawai'i Dairy Farms, Notice of Preparation of Environmental Impact Statement", then click on "Files" and "Download a copy". (Any issues accessing the document should be directed to Jonathan Real, Applications/Systems Analyst at 587-0427 or Jonathan.C.Real@hawaii.gov)

Please submit any comments by February 18, 2015. If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Supervising Land Agent Steve Molmen at (808) 587-0439. Thank you.

Attachments

( ) We have no objections.
( ) We have no comments.
(✓) Comments are attached.

Signed: Olivia Takashige
Print Name: Carty S. Chang, Chief Engineer
Date: 2/17/15

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

LD/ Russell Y. Tsuji
REF: EISPN for Hawaii Dairy Farms, Koloa District
Kauai.002

COMMENTS

(X) We confirm that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Zone X. The National Flood Insurance Program (NFIP) does not regulate developments within Zone X.

( ) Please take note that the project site according to the Flood Insurance Rate Map (FIRM), is located in Zone ___.

( ) Please note that the correct Flood Zone Designation for the project site according to the Flood Insurance Rate Map (FIRM) is ___.

( ) Please note that the project must comply with the rules and regulations of the National Flood Insurance Program (NFIP) presented in Title 44 of the Code of Federal Regulations (44CFR), whenever development within a Special Flood Hazard Area is undertaken. If there are any questions, please contact the State NFIP Coordinator, Ms. Carol Tyau-Beam, of the Department of Land and Natural Resources, Engineering Division at (808) 587-0267.

Please be advised that 44CFR indicates the minimum standards set forth by the NFIP. Your Community's local flood ordinance may prove to be more restrictive and thus take precedence over the minimum NFIP standards. If there are questions regarding the local flood ordinances, please contact the applicable County NFIP Coordinators below:

( ) Mr. Mario Siu Li at (808) 768-8098 of the City and County of Honolulu, Department of Planning and Permitting.
( ) Mr. Frank DeMarco at (808) 961-8042 of the County of Hawaii, Department of Public Works.
( ) Mr. Carolyn Cortez at (808) 270-7253 of the County of Maui, Department of Planning.
( ) Mr. Stanford Iwamoto at (808) 241-4896 of the County of Kauai, Department of Public Works.

( ) The applicant should include project water demands and infrastructure required to meet water demands. Please note that the implementation of any State-sponsored projects requiring water service from the Honolulu Board of Water Supply system must first obtain water allocation credits from the Engineering Division before it can receive a building permit and/or water meter.

( ) The applicant should provide the water demands and calculations to the Engineering Division so it can be included in the State Water Projects Plan Update.

( ) Additional Comments: _____

( ) Other: _____

Should you have any questions, please call Mr. Dennis Imada of the Planning Branch at 587-0257.

Signed: Chris Fabozluzje
CARTY S. CHANG, CHIEF ENGINEER
Date: 2/17/15

State of Hawaii
FLOOD HAZARD ASSESSMENT REPORT

NATIONAL FLOOD INSURANCE PROGRAM

FLOOD ZONE DEFINITIONS

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD – The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zone A, AE, AH, AO, V, and VE. The Base Flood Elevation (BFE) is the water-surface elevation of the 1% annual chance flood. Mandatory flood insurance purchase applies in these zones:

- **Zone A:** No BFE determined.
- **Zone AE:** BFE determined.
- **Zone AH:** Flood depths of 1 to 3 feet (usually areas of ponding); BFE determined.
- **Zone AO:** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined.
- **Zone V:** Coastal flood zone with velocity hazard (wave action); no BFE determined.
- **Zone VE:** Coastal flood zone with velocity hazard (wave action); BFE determined.
- **Zone AEF:** Floodway areas in Zone AE. The floodway is the channel of stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without increasing the BFE.

NON-SPECIAL FLOOD HAZARD AREA – An area in a low-to-moderate risk flood zone. No mandatory flood insurance purchase requirements apply, but coverage is available in participating communities.

- **Zone XS (X shaded):** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.
- **Zone X:** Areas determined to be outside the 0.2% annual chance floodplain.

OTHER FLOOD AREAS

- **Zone D:** Unstudied areas where flood hazards are undetermined, but flooding is possible. No mandatory flood insurance purchase requirements apply, but coverage is available in participating communities.

PROPERTY INFORMATION

COUNTY:	KAUAI
TMK NO:	(4) 2-9-003-001
PARCEL ADDRESS:	
FIRM INDEX DATE:	NOVEMBER 26, 2010
LETTER OF MAP CHANGE(S):	NONE
FEMA FIRM PANEL(S):	1500020317F-NOVEMBER 26, 2010 1500020318F-NOVEMBER 26, 2010 1500020316E - PANEL NOT PRINTED
PARCEL DATA FROM:	JANUARY 2012
IMAGERY DATA FROM:	MAY 2005

IMPORTANT PHONE NUMBERS

County NFIP Coordinator	
County of Kauai	
Stanford Iwamoto, P.E.	(808) 241-4896
State NFIP Coordinator	
Carol Tyau-Beam, P.E., CFM	(808) 587-0267

Disclaimer: The Department of Land and Natural Resources (DLNR) assumes no responsibility arising from the use of the information contained in this report. Viewers/Users are responsible for verifying the accuracy of the information and agree to indemnify the DLNR from any liability, which may arise from its use.

If this map has been identified as 'PRELIMINARY' or 'UNOFFICIAL', please note that it is being provided for informational purposes and is not to be used for official/legal decisions, regulatory compliance, or flood insurance rating. Contact your county NFIP coordinator for flood zone determinations to be used for compliance with local floodplain management regulations.

GROUP 70
INTERNATIONAL

May 26, 2016

Mr. Carty S. Chang, P.E.
Chief Engineer
State of Hawai'i
Department of Land and Natural Resources
Engineering Division
Post Office Box 621
Honolulu, Hawaii 96809

Subject: Hawai'i Dairy Farms Environmental Impact Statement (EIS) Preparation Notice
Māhā'ulepū, Kōloa District, Kaua'i, Hawai'i
Response to Comment on EISPN

Dear Mr. Chang:

Thank you for your input dated January 26, 2015 on the Hawai'i Dairy Farms Environmental Impact Statement Preparation Notice (EISPN). We acknowledge that the project site is located in Zone X per the Flood Insurance Rate Map, and that the National Flood Insurance Program does not regulate developments within this zone.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,
GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

cc: Hawai'i Dairy Farms
Hawai'i State Department of Health,
Environmental Planning Office

Group 70 International • 925 Bethel Street, 5th Floor • Honolulu, HI 96813-4398 • tel. 808.523.5866 • fax. 808.523.5874 • www.group70int.com

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

March 12, 2015

Group 70 International, Inc. via email: HDF@Group70int.com
Attn: Jeff Overton, Principal Planner
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813-4307

State of Hawaii, Department of Health
Environmental Planning Office
Attn: Laura McIntyre, Program Manager via email: Laura.McIntyre@doh.hawaii.gov
919 Ala Moana Boulevard, Rm. 312
Honolulu, Hawaii 96814

Dear Mr. Overton and Ms. McIntyre,

SUBJECT: Hawai'i Dairy Farms, Notice of Preparation of Environmental Impact Statement

Thank you for the opportunity to review and comment on the subject matter. In addition to the comments sent to you dated February 13 and March 3, 2015, enclosed are additional comments from the Commission on Water Resource Management on the subject matter. Should you have any questions, please feel free to call Supervising Land Agent Steve Molmen at (808) 587-0439. Thank you.

Sincerely,

Russell Y. Tsuji
Land Administrator

Enclosure(s)

DAVID Y. IGE
GOVERNOR OF HAWAII

CARTY S. CHANG
ACTING CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

FIRST DEPUTY

WILLIAM M. TAM
INTERIM DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

January 26, 2015

MEMORANDUM

RECEIVED
LAND DIVISION
2015 MAR -5 PM 3:01
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

TO: **DLNR Agencies:**
X Div. of Aquatic Resources
__Div. of Boating & Ocean Recreation
X Engineering Division
X Div. of Forestry & Wildlife
__Div. of State Parks
X Commission on Water Resource Management
X Office of Conservation & Coastal Lands
X Land Division – Kauai District
X Historic Preservation

FR:

TO:

FROM: Russell Y. Tsuji, Land Administrator
SUBJECT: Hawai'i Dairy Farms, Notice of Preparation of Environmental Impact Statement
LOCATION: Island of Kauai, Koloa District, Tax Map Key(s): (4) 2-9-003: 001 (portion) & 006 (portion); (4) 2-9-001:001 (portion)
APPLICANT: Hawai'i Dairy Farms, LLC, by its planning consultant Group 70 International, Inc.

Transmitted for your review and comment on the above-referenced document. We would appreciate your comments on this document which can be found here:

1. Go to: https://sp01.ld.dlnr.hawaii.gov/LD
2. Login: Username: LD\Visitor Password: 0pa$$word0 (first and last characters are zeros)
3. Click on: Requests for Comments. Click on the subject file "Hawai'i Dairy Farms, Notice of Preparation of Environmental Impact Statement", then click on "Files" and "Download a copy". (Any issues accessing the document should be directed to Jonathan Real, Applications/Systems Analyst at 587-0427 or Jonathan.C.Real@hawaii.gov)

Please submit any comments by February 18, 2015. If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Supervising Land Agent Steve Molmen at (808) 587-0439. Thank you.

Attachments

( ) We have no objections.
( ) We have no comments.
(x) Comments are attached.

Signed: W Roy Hardy
Print Name: W. Roy Hardy, Acting Deputy Director
Date: 3/3/15

FILE ID: RFD.3989.2
DOC ID: 119581

DAVID Y. IGE
GOVERNOR OF HAWAII

CARTY S. CHANG
ACTING CHAIRPERSON

DENISE ANTOLINI
KAMANA BEAMER
MICHAEL G. BUCK
MILTON D. PAVAO
VIRGINIA PRESSLER, M.D.
JONATHAN STARR

W. ROY HARDY
ACTING DEPUTY DIRECTOR

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT
P.O. BOX 621
HONOLULU, HAWAII 96809

March 4, 2015

REF: RFD.3989.2

TO: Russell Tsuji, Administrator
Land Division

FROM: W. Roy Hardy, Acting Deputy Director
Commission on Water Resource Management

SUBJECT: Hawaii Dairy Farms 582-acre Dairy Farm, Mahaulepu Valley, Kauai

FILE NO.:
TMK NO.: (4) 2-9-003:001 (portion) & 006 (portion); (4) 2-9-001:001 (portion)

Thank you for the opportunity to review the subject document. The Commission on Water Resource Management (CWRM) is the agency responsible for administering the State Water Code (Code). Under the Code, all waters of the State are held in trust for the benefit of the citizens of the State, therefore, all water use is subject to legally protected water rights. CWRM strongly promotes the efficient use of Hawaii's water resources through conservation measures and appropriate resource management. For more information, please refer to the State Water Code, Chapter 174C, Hawaii Revised Statutes, and Hawaii Administrative Rules, Chapters 13-167 to 13-171. These documents are available via the Internet at http://www.hawaii.gov/dlnr/cwrm.

Our comments related to water resources are checked off below.

☐ 1. We recommend coordination with the county to incorporate this project into the county's Water Use and Development Plan. Please contact the respective Planning Department and/or Department of Water Supply for further information.

☐ 2. We recommend coordination with the Engineering Division of the State Department of Land and Natural Resources to incorporate this project into the State Water Projects Plan.

☐ 3. We recommend coordination with the Hawaii Department of Agriculture (HDOA) to incorporate the reclassification of agricultural zoned land and the redistribution of agricultural resources into the State's Agricultural Water Use and Development Plan (AWUDP). Please contact the HDOA for more information.

☐ 4. We recommend that water efficient fixtures be installed and water efficient practices implemented throughout the development to reduce the increased demand on the area's freshwater resources. Reducing the water usage of a home or building may earn credit towards Leadership in Energy and Environmental Design (LEED) certification. More information on LEED certification is available at http://www.usgbc.org/leed. A listing of fixtures certified by the EPA as having high water efficiency can be found at http://www.epa.gov/watersense/.

☐ 5. We recommend the use of best management practices (BMP) for stormwater management to minimize the impact of the project to the existing area's hydrology while maintaining on-site infiltration and preventing polluted runoff from storm events. Stormwater management BMPs may earn credit toward LEED certification. More information on stormwater BMPs can be found at http://hawaii.gov/dbedt/czm/initiative/lid.php.

☐ 6. We recommend the use of alternative water sources, wherever practicable.

☐ 7. We recommend participating in the Hawaii Green Business Program, that assists and recognizes businesses that strive to operate in an environmentally and socially responsible manner. The program description can be found online at http://energy.hawaii.gov/green-business-program

DRF-IA 03/20/2013

☐ 8. We recommend adopting landscape irrigation conservation best management practices endorsed by the Landscape Industry Council of Hawaii. These practices can be found online at http://www.hawaiiscape.com/wp-content/uploads/2013/04/LICH_Irrigation_Conservation_BMPs.pdf

☐ 9. There may be the potential for ground or surface water degradation/contamination and recommend that approvals for this project be conditioned upon a review by the State Department of Health and the developer's acceptance of any resulting requirements related to water quality.

Permits required by CWRM:
Additional information and forms are available at http://hawaii.gov/dlnr/cwrm/info_permits.htm.

☐ 10. The proposed water supply source for the project is located in a designated water management area, and a Water Use Permit is required prior to use of water. The Water Use Permit may be conditioned on the requirement to use dual line water supply systems for new industrial and commercial developments.

☐ 11. A Well Construction Permit(s) is (are) required before any well construction work begins.

☐ 12. A Pump Installation Permit(s) is (are) required before ground water is developed as a source of supply for the project.

☐ 13. There is (are) well(s) located on or adjacent to this project. If wells are not planned to be used and will be affected by any new construction, they must be properly abandoned and sealed. A permit for well abandonment must be obtained.

☐ 14. Ground water withdrawals from this project may affect streamflows, which may require an instream flow standard amendment.

☒ 15. A Stream Channel Alteration Permit(s) is (are) required before any alteration(s) can be made to the bed and/or banks of a stream channel.

☒ 16. A Stream Diversion Works Permit(s) is (are) required before any stream diversion works is (are) constructed or altered.

☒ 17. A Petition to Amend the Interim Instream Flow Standard is required for any new or expanded diversion(s) of surface water.

☐ 18. The planned source of water for this project has not been identified in this report. Therefore, we cannot determine what permits or petitions are required from our office, or whether there are potential impacts to water resources.

☒ OTHER:
The EISPN states existing onsite wells will provide potable water from dairy operations and facility use. Our records show there is a well, Well No. 5425-001, located in the middle of TMK 2-9-003:001 that has been lost and is assumed to be abandoned. If this well is found, it should be properly abandoned and sealed, as this well was drilled in the late 1890's and is presumably in poor condition. There is another well located on the boundary of the same TMK, Well No. 5425-015. Our records indicate this well is currently being used for municipal water supply by Kauai Department of Water. The draft EIS should discuss the status of these wells, future plans for the wells, identify any other wells within the project area, identify the wells proposed to be used for potable supply, provide an estimate of water demands, both potable and non-potable, and provide the calculations used to derive the demand estimates.

If there are any questions, please contact Dean Uyeno of the Stream Protection and Management Branch at 587-0234 or Ryan Imata of the Ground Water Regulation Branch at 587-0225.

GROUP 70
INTERNATIONAL

May 26, 2016

Mr. Jeffrey T. Pearson
Deputy Director
State of Hawai'i
Department of Land and Natural Resources
Commission on Water Resource Management
P.O. Box 621
Honolulu, HI 96809

Subject: Hawai'i Dairy Farms Environmental Impact Statement (EIS) Preparation Notice
Māhā'ulepū, Kōloa District, Kaua'i, Hawai'i
Response to Comment on EISPN

Dear Mr. Pearson:

Thank you for the input provided by Commission on Water Resource Management dated March 4, 2015 on the Hawai'i Dairy Farms Environmental Impact Statement Preparation Notice (EISPN). The Hawai'i Dairy Farms project will not require any Stream Channel Alteration Permits as it will not alter the bed and/or banks of any stream channel. The project will not require a Stream Diversion Works Permit as no stream diversion work will be required for this project, and no Petition to Amend the Interim Instream Flow Standard will be required, as there are no new or expanded diversions of surface water planned for this project.

1. Status of Onsite Wells. Well No. 5425-001 is listed in records as one of the original ten wells in the Well 14 Battery. All of these were abandoned in place in 1928 when the battery was modified with new wells and above ground line shaft turbine pumps. Of the four new wells that were drilled in 1927-28, only three were able to be found. These three remaining wells will serve as the main source of potable water for the project. This information was provided by groundwater consultant Tom Nance Water Resource Engineering (TNWRE); the full assessment is Appendix E of the Draft EIS.

2. Potable Water Wells Near the HDF Site. The Hawai'i Dairy Farms site is comprised of portions of three TMK parcels, and occupies just 557-acres in total (Section 3.1 and Figure 3.1-2 of the Draft EIS). Well No. 5425-015 is referred to as Kōloa F well in the Draft EIS, and is the closest public water source to the project. The three wells onsite were given State numbers 5425-12, 5425-13 and 5425-14. Known as the "Māhā'ulepū 14" wells, the closest of these wells is located 4,500 feet from the Kōloa F well. The Kōloa F taps into the volcanics of the west valley wall, at an approximate depth of 247 feet below sea level; the Māhā'ulepū 14 well reaches approximately 447 feet below sea level.

HDF has agreed to a 1,000-foot buffer from the Kōloa F well in which no grazing and no application of nutrients will occur, even though the groundwater assessment confirmed no hydrologic connection between shallow groundwater in the alluvium and groundwater in deep volcanics.

Group 70 International • 925 Bethel Street, 5th Floor • Honolulu, HI 96813-4398 • tel. 808.523.5866 • fax. 808.523.5874 • www.group70int.com

3. Estimated Water Demand for the Dairy Project. HDF is committed to establishing a herd of up to 699 mature milking cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. At the committed herd size, the dairy will utilize 30,000 gallons per day of potable groundwater from on-site wells for livestock water and sanitation in the milking parlor. At the discretion of HDF, should it choose to expand operations up to 2,000 mature dairy cows, the potable water demand would increase by 54,800 gallons per day, for a total of 84,800 gallons per day. The hydrologic assessment determined that the modest potable water demand by HDF from the remaining onsite wells (referred to as the "Māhā'ulepū 14 wells") will not adversely impact the County's Kōloa F well. See the Draft EIS, Section 4.16 for a full discussion of hydrology and groundwater in Māhā'ulepū.

Non-potable water will be sourced from Waita Reservoir. Irrigation demand, the primary use of non-potable water, is estimated conservatively for planning purposes at 2.26 million gallons per day.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,
GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

cc: Hawai'i Dairy Farms
Hawai'i State Department of Health,
Environmental Planning Office

DAVID Y. IGE
GOVERNOR OF HAWAII

VIRGINIA PRESSLER, M.D.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HI 96801-3378

In reply, please refer to:
File:

01018PGH.15

January 16, 2015

Hawai'i Dairy Farms, LLC.
P.O. Box 1690
Koloa, Hawaii 96756-1690

To Whom It May Concern:

SUBJECT: Comments on Environmental Impact Statement – Preparation Notice
Hawaii Dairy Farms
Mahaulepu, Island of Kauai, Hawaii

The Department of Health (DOH), Clean Water Branch (CWB), acknowledges your request for comments on your project. The DOH-CWB has reviewed the subject document and offers these comments. Please note that our review is based solely on the information provided in the subject document and its compliance with the Hawaii Administrative Rules (HAR), Chapters 11-54 and 11-55. You may be responsible for fulfilling additional requirements related to our program. We recommend that you also read our standard comments on our website at: http://health.hawaii.gov/epo/files/2013/05/Clean-Water-Branch-Std-Comments.pdf.

1. Any project and its potential impacts to State waters must meet the following criteria:

   a. Antidegradation policy (HAR, Section 11-54-1.1), which requires that the existing uses and the level of water quality necessary to protect the existing uses of the receiving State water be maintained and protected.

   b. Designated uses (HAR, Section 11-54-3), as determined by the classification of the receiving State waters.

   c. Water quality criteria (HAR, Sections 11-54-4 through 11-54-8).

2. You may be required to obtain National Pollutant Discharge Elimination System (NPDES) permit coverage for discharges of wastewater, including storm water runoff, into State surface waters (HAR, Chapter 11-55).

For NPDES general permit coverage, a Notice of Intent (NOI) form must be submitted at least 30 calendar days before the commencement of the discharge. An application for a NPDES individual permit must be submitted at least 180 calendar days before the commencement of the discharge. To request NPDES permit coverage, you must submit the applicable form ("CWB Individual NPDES Form" or "CWB NOI Form")

through the e-Permitting Portal and the hard copy certification statement with the respective filing fee ($1,000 for an individual NPDES permit or $500 for a Notice of General Permit Coverage). Please open the e-Permitting Portal website located at: https://eha-cloud.doh.hawaii.gov/epermit/. You will be asked to do a one-time registration to obtain your login and password. After you register, click on the Application Finder tool and locate the appropriate form. Follow the instructions to complete and submit the form.

3. If your project involves work in, over, or under waters of the United States, it is highly recommended that you contact the Army Corp of Engineers, Regulatory Branch (Tel: 438-9258) regarding their permitting requirements.

Pursuant to Federal Water Pollution Control Act [commonly known as the "Clean Water Act" (CWA)], Paragraph 401(a)(1), a Section 401 Water Quality Certification (WQC) is required for "[a]ny applicant for Federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may **result** in any discharge into the navigable waters..." (emphasis added). The term "discharge" is defined in CWA, Subsections 502(16), 502(12), and 502(6); Title 40 of the Code of Federal Regulations, Section 122.2; and Hawaii Administrative Rules (HAR), Chapter 11-54.

4. Please note that all discharges related to the project construction or operation activities, whether or not NPDES permit coverage and/or Section 401 WQC are required, must comply with the State's Water Quality Standards. Noncompliance with water quality requirements contained in HAR, Chapter 11-54, and/or permitting requirements, specified in HAR, Chapter 11-55, may be subject to penalties of $25,000 per day per violation.

If you have any questions, please visit our website at: http://health.hawaii.gov/cwb/, or contact the Engineering Section, CWB, at (808) 586-4309.

Sincerely,

ALEC WONG, P.E., CHIEF
Clean Water Branch

GH:bk

c: Jeff Overton, Group 70 International, Inc. [via e-mail HDF@Group70int.com only]
DOH-EPO [via e-mail only]

GROUP 70 INTERNATIONAL

May 26, 2016

Mr. Alec Wong, P.E.
Chief
State of Hawai'i
Department of Health
Clean Water Branch
Post Office Box 3378
Honolulu, Hawai'i 96801-3378

Subject: Hawai'i Dairy Farms Environmental Impact Statement (EIS) Preparation Notice
Māhā'ulepū, Kōloa District, Kaua'i, Hawai'i
Response to Comment on EISPN

Dear Mr. Wong:

Thank you for your input dated January 16, 2015 on the Hawai'i Dairy Farms (HDF) Environmental Impact Statement Preparation Notice (EISPN). We acknowledge your comments and provide the responses below.

1. Criteria for State Waters. The project will meet the applicable criteria found in the State's Antidegredation Policy (HAR Section 11-54-1.1), Designated Uses (HAR Section 11-54-3), and Water Quality Criteria (HAR Sections 11-54-4 through 11-54-8).

2. National Pollutant Discharge Elimination System (NPDES). Best management practices are described in Section 4.17, Surface Water Resources & Nearshore Marine Environment. These practices will be documented in the Stormwater Pollution Protection Plan to be submitted as part of the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit.

3. Work Not Affecting Waters of the United States. Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Future farm improvements are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads with application of best management practices.

4. State Water Quality Standards. HDF will not contribute to any exceedance of State Water Quality Standards. HDF occupies a 557-acre area within a sub-watershed of approximately 2,700 acres.

Marine Research Consultants, Inc. (MRCI) collected baseline data on biological and chemical constituents within surface waters and open ocean coastal waters downgradient of the HDF site. Twelve surface water sampling sites were established to collect data to provide a baseline and for future monitoring. Results of surface water analysis indicate that nutrients from surrounding lands, containing

some leachate, drain into the ditches on the HDF site. However, analysis of samples show that by the time surface water reached sampling sites closer to the ocean, nutrient levels had returned to those similar to the mauka sampling stations above the HDF site.

During the rainfall and runoff events, the dairy's nutrient contributions would be further diluted by additional volume of surface runoff and ditch flows. The terminus of Waiopili Ditch is a deep, muddy basin that joins the ocean through a channel cut through beach sand. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline. MRCI concluded there will be no substantial effects to marine water quality from the HDF dairy.

A Sanitary Survey prepared for the Māhā'ulepū sub-watershed by the State of Hawai'i Clean Water Branch describes the surface water terminating near the shoreline at the end of Waiopili Ditch is not a recreational body of water. Further, the Sanitary Survey found no significant impact to the Waiopili Ditch from any activity that can be attributed to the dairy.

In compliance with national and State Clean Water regulations, HDF will institute appropriate controls and procedures to manage stormwater during construction, and to minimize the potential for non-point pollution in stormwater run-off. Both management controls and structural controls will be implemented in the short-term. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; prohibiting leaking or poorly-maintained construction equipment and machinery; and keeping adjacent public, paved streets free of dirt and mud. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Following construction, controls will include establishment of buffer zones and setbacks. Best management practices include setbacks to minimize impacts to waterways. HDF will not graze cows or apply effluent within 1,000-feet of the Kōloa F well, in agreement with the County Department of Water. Throughout the HDF site, effluent application setbacks totaling 100 feet in width – 50 feet from the top of either side of a waterway – will keep nutrient applications away from waterways. Vegetative buffers totaling 70 feet in width – 35 feet on either side measured from the top of the agricultural ditches – will be to improve and maintain water quality and reduce erosion. Fences will be erected along the 35-foot setbacks to exclude cows from the buffer areas; vegetation along the buffer will trap soil particles and organic debris in order to minimize inputs to stormwater runoff. Vegetation in and adjacent to the ditches will be maintained to control overgrowth and minimize ditch bank soil erosion.

5. HDF notes your comment regarding non-compliance, fines, and penalties.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,
GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

cc: Hawai'i Dairy Farms
Hawai'i State Department of Health,
Environmental Planning Office

From: Oshiro, Peter S.
Sent: Tuesday, January 13, 2015 10:06 AM
To: McIntyre, Laura; Bal, Dileep G.; Takamura, Gerald N.; Pruder, Sina L; Wong, Alec Y
Cc: Stoddard, Lilian (Libby); Morikami, Lori N; Lum, Darryl C; Haae, Glenn; Nakasone, Lynn M.; Yamada, Stuart H; Gill, Gary L.; Acido-Mercado, Leticia [Tish] R.; Narimatsu, Noella
Subject: RE: Hawaii Dairy Farm EISPN document and Publication Notice

Aloha Laura,
No comments/concerns from Sanitation at this time.

Peter Oshiro
Environmental Health Program Manager
Sanitation/Food and Drug/Vector Control
Phone # (808) 586-8020
peter.oshiro@doh.hawaii.gov

GROUP 70 INTERNATIONAL

May 26, 2016

Mr. Peter Oshiro
Environmental Health Program Manager
State of Hawai'i
Department of Health
Sanitation Branch
591 Ala Moana Blvd.
Honolulu, Hawai'i 96813

Subject: Hawai'i Dairy Farms Environmental Impact Statement (EIS) Preparation Notice
Māhā'ulepū, Kōloa District, Kaua'i, Hawai'i
Response to Comment on EISPN

Dear Mr. Oshiro:

Thank you for your input dated January 13, 2015 on the Hawai'i Dairy Farms Environmental Impact Statement Preparation Notice (EISPN). We acknowledge that the Sanitation Branch has no comments at this time.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,
GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

cc: Hawai'i Dairy Farms
Hawai'i State Department of Health,
Environmental Planning Office

DAVID Y. IGE
GOVERNOR OF HAWAII

VIRGINIA PRESSLER, M.D.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P.O. Box 3378
HONOLULU, HAWAII 96801-3378

In reply, please refer to:
File:

March 19, 2015

RECEIVED 15-170A CAB

MAR 25 2015

GROUP 70 INTL

Mr. Jeff Overton
Principal Planner
Group 70 International, Inc.
925 Bethel Street, Fifth Floor
Honolulu, Hawaii 96813

Dear Mr. Overton:

SUBJECT: **Environmental Impact Statement Preparation Notice**
Hawaii Dairy Farms Project, Poipu, Kauai

A significant potential for fugitive dust emissions and nuisance odors exist during all phases of construction and operations. The activities must comply with the provisions of Hawaii Administrative Rules, §11-60.1-33 on Fugitive Dust. In addition, for cases involving mixed land use, we strongly recommend that buffer zones be established, wherever possible, in order to alleviate potential dust and odor nuisance problems.

We encourage the contractor to implement a dust control plan, which does not require approval by the Department of Health, to comply with the fugitive dust regulations. The dust control measures may include, but are not limited to, the following:

a) Planning the different phases of construction, focusing on minimizing the amount of dust-generating materials and activities, centralizing on-site vehicular traffic routes, and locating potential dust-generating equipment in areas of the least impact;
b) Providing an adequate water source at the site prior to start-up of construction activities;
c) Landscaping and providing rapid covering of bare areas, including slopes, starting from the initial grading phase;
d) Minimizing dust from shoulders and access roads;
e) Providing adequate dust control measures during weekends, after hours, and prior to daily start-up of construction activities; and
f) Controlling dust from debris being hauled away from the project site. Also, controlling dust from daily operations of material being processed, stockpiled, and hauled to and from the facility.

We also recommend that the Environmental Impact Statement address potential nuisance odor impacts to nearby communities and the mitigation measures that will be employed.

If you have any questions, please contact Mr. Barry Ching of the Clean Air Branch at 586-4200.

Sincerely,

NOLAN S. HIRAI, P.E.
Manager, Clean Air Branch

BC:rg
c: Hawaii Dairy Farms, LLC
Laura McIntyre, Environmental Planning Office, Department of Health

GROUP 70 INTERNATIONAL

May 26, 2016

Mr. Nolan S. Hirai, P.E.
Manager
State of Hawai'i
Department of Health
Clean Air Branch
Post Office Box 3378
Honolulu, Hawai'i 96801-3378

Subject: Hawai'i Dairy Farms Environmental Impact Statement (EIS) Preparation Notice
Māhā'ulepū, Kōloa District, Kaua'i, Hawai'i
Response to Comment on EISPN

Dear Mr. Hirai:

Thank you for your input dated March 19, 2015 on the Hawai'i Dairy Farms Environmental Impact Statement Preparation Notice (EISPN).

1. Fugitive Dust. We acknowledge your comments that the construction and operations of the Dairy Farm must comply with the provisions of Hawai'i Administrative Rules (HAR) §11-60.1-33 regarding Fugitive Dust. As a part of the DEIS, existing air quality conditions and project impacts were evaluated, including dust, odor, and greenhouse gas (GHG) production. A full year of meteorological data (for 2014) was obtained for the project site. Depicted on a windrose, the data shows predominant winds from the northeast.

2. Dust Control Measures – Construction Period. Short-term impacts may consist of exhaust emissions from construction equipment and increased vehicular activity during the construction phase, and fugitive dust emissions during soil excavation. Vehicular access to the site during construction will include limited delivery of construction materials and heavy equipment for site work, and daily vehicle access to the site by construction workers. Short-term construction dust will be reduced through implementation of dust control measures as recommended by DOH Clean Air Branch, including using water to control dust on disturbed surfaces and haul roads, limiting the disturbed area at any given time, and/or mulching or stabilizing inactive areas that have been worked, and establishing and monitoring speed limits for trucks on-site.

3. Dust Control Measures – Long Term Operations. Long-term impacts from dairy operations would create particulate matter (PM) in the form of dust. Fugitive dust concentrations were modeled for HDF by applying the PM rates from available literature, which measured PM from a "dry lot" used for traditional confinement dairies. Using these dust rates in the model, therefore, over-estimate the potential quantity of PM, because HDF will utilize a pasture-based system. The HDF system will have cows off pasture just two hours each day.

Using atmospheric dispersion modeling system (AERMOD), the rates were scaled to the size of the non-pasture areas used by cows at HDF. Results were added to the background concentration of particulate matter (both PM_{10} and $PM_{2.5}$) measured on the island of O'ahu. This was considered the total impact and was compared to the State ambient air quality standards. Only the contemplated herd size of up to 2,000 milking cows was modeled, as at the lower threshold of 699 cows the potential fugitive dust impact would be negligible.

Modeling using the higher fugitive dust rates resulted in 0.6 tons per year for the 699 herd size. PM emissions modeled from HDF operations will not exceed State standards. This analysis is further described in Draft EIS Section 4.19.

The estimated concentration for PM_{10} is 2.01 $\mu g/m^3$ per 24-hour period, which is well below the State standard of 150 $\mu g/m^3$. The estimated concentration for $PM_{2.5}$ is 0.23 $\mu g/m^3$ per 24-hour period, which is well below the Federal standard of 35 $\mu g/m^3$.

The total annual particulate matter emissions wer modelled to be 0.6 tons per year for a herd size of 699 mature dairy cows, and 3.3 tons per year for a potential future contemplated herd size of up to 2,000 mature dairy cows. The project will not require any permits under the Clean Air Act, or State of Hawai'i counterpart.

4. Odor Control. Odor refers to the combined effects of a mixture of gases on the sense of smell. Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF. Air dispersion models were used to determine potential odor levels based on the dairy facility design and established modeling methods. Local weather data was used in conjunction with the AERMOD (version 1) modeling system to evaluate odors documented for dairy heifers and effluent ponds.

Modeling results mapped an odor isopleth which displays the area in which odor may be detected by 50 percent of the sensitive population 44 hours out of every year. The extent of detectable odors for the committed herd size of 699 mature dairy cows may extend up to 1,670 feet south of the site under the worst case scenario when winds are light. Should HDF decide in the future to increase the herd size up to 2,000 mature dairy cows, the isopleth extend to 2,780 feet south of HDF. This would reach into the adjoining farm lands, but remains far from resort and residential areas.

The modeling considers the worse-case meteorological conditions, so it is likely odor detection beyond the HDF boundaries will be less frequent. Best Management Practices to reduce odor impacts include establishment of a windbreak. Windbreaks, also known as shelterbelts, are used for a variety of purposes including reduction and interception of airborne odors. For additional analysis, please see Draft EIS Section 4.19.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,
GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

cc: Hawai'i Dairy Farms
Hawai'i State Department of Health,
Environmental Planning Office

DAVID Y. IGE
GOVERNOR OF HAWAII

VIRGINIA PRESSLER, M.D.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HI 96801-3378

In reply, please refer to:
File:
LUD – 4 2 9 003 001 etc
EISPN HawaiiDairyFarm-ID2025

March 25, 2015

RECEIVED

MAR 30 2015

GROUP 70 INTL

Mr. Jeffrey H. Overton, AICP, LEED AP
Group 70 International
925 Bethel Street 5th Floor
Honolulu, Hawaii 96813-4307

Dear Mr. Overton:

Subject: Environmental Impact Statement Preparation Notice
Hawaii Dairy Farm, Mahaulepu Road, Koloa, Kauai
TMK (4) 2-9-003: 001 portion and 006 portion
TMK (4) 2-9-001: 001 portion

Thank you for allowing us the opportunity to provide comments on the above subject project. We have the following information to offer.

The subject project is located in the critical wastewater disposal area as determined by the Kauai County Wastewater Advisory Committee. We have several treatment individual wastewater systems (IWSs) (septic tanks) files in our database system. For development consideration, please show all proposed existing structures and treatment IWSs and animal wastewater management systems on the final plot map including setback distances to any newly adjusted property lines and/or buildings. We await the preparation of both the Draft Environmental Impact Statement (EIS) and Final EIS for wastewater treatment and disposal plans for review.

All wastewater plans must conform to applicable provisions of the Hawaii Administrative Rules, Chapter 11-62, "Wastewater Systems." Should you have any questions, please contact Mr. Mark Tomomitsu, Supervisor, Planning & Design Section, Wastewater Branch at number (808) 586-4294 or fax (808) 586-4300.

Sincerely,

SINA PRUDER, P.E., CHIEF
Wastewater Branch

LM/MST:lmj

c: Ms. Laura McIntyre, DOH-Environmental Planning Office (15-005)
Ms. Lori Vetter, DOH-WWB's Kauai Staff

GROUP 70
INTERNATIONAL

May 26, 2016

Ms. Sina Pruder, P.E.
Chief
State of Hawai'i
Department of Health
Wastewater Branch
Post Office Box 3378
Honolulu, Hawai'i 96801-3378

Subject: Hawai'i Dairy Farms Environmental Impact Statement (EIS) Preparation Notice
Māhā'ulepū, Kōloa District, Kaua'i, Hawai'i
Response to Comment on EISPN

Dear Ms. Pruder:

Thank you for your input dated March 25, 2015 on the Hawai'i Dairy Farms Environmental Impact Statement Preparation Notice (EISPN).

1. Critical Wastewater Disposal Area. We acknowledge your comments that the project is located in a critical wastewater disposal area as determined by the Kaua'i County Wastewater Advisory Committee. Please see below regarding the individual wastewater system to be utilized at the site. Livestock waste effluent ponds will be designed in compliance with the University of Hawai'i's Guidelines for Waste Management.

2. Conformance with HAR Ch. §11-62. All wastewater plans will conform to applicable provisions of Hawai'i Administrative Rules §11-62, "Wastewater Systems". The project plans to utilize a Department of Health-approved septic system for a flow of 700 gpd, with a 1,500 gallon capacity septic tank. The facilities, structures and effluent ponds are described in Draft EIS Section 3.3 – Dairy Site Requirements and Layout.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Group 70 International • 925 Bethel Street, 5th Floor • Honolulu, HI 96813-4398 • tel. 808.523.5866 • fax. 808.523.5874 • www.group70int.com

Thank you for your participation in the environmental review process.

Sincerely,
GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

cc: Hawai'i Dairy Farms
Hawai'i State Department of Health,
Environmental Planning Office

DAVID Y. IGE
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

FORD N. FUCHIGAMI
DIRECTOR

Deputy Directors
JADE T. BUTAY
ROSS M. HIGASHI
EDWIN H. SNIFFEN
DARRELL T. YOUNG

IN REPLY REFER TO:

STP 8.1747

February 9, 2015

RECEIVED
FEB 20 2015
GROUP 70 INTL

Mr. Jeffrey H. Overton
Principal Planner
Group 70 International, Inc.
925 Bethel Street, Fifth Floor
Honolulu, Hawaii 96813-4307

Dear Mr. Overton:

Subject: Hawaii Dairy Farms
Environmental Impact Statement Preparation Notice (EISPN)
TMK: (4) 2-9-003:001 (por.) and 006 (por.); (4) 2-9-001:001 (por.)

Our Department of Transportation's (DOT) comments on the subject project are as follows:

The subject project is not expected to significantly impact the State highway facility. However, a permit from DOT Highways Division, Kauai District Office is required for the transport of oversized and/or overweight materials and equipment on State highway facilities.

If there are any questions, please contact Mr. Norren Kato of the DOT Statewide Transportation Planning Office at telephone number (808) 831-7976.

Sincerely,

FORD N. FUCHIGAMI
Director of Transportation

c: Laura McIntyre, Department of Health, Environmental Planning Office

GROUP 70
INTERNATIONAL

May 26, 2016

Mr. Ford N. Fuchigami
Director of Transportation
State of Hawai'i
Department of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813-5097

Subject: Hawai'i Dairy Farms Environmental Impact Statement (EIS) Preparation Notice
Māhā'ulepū, Kōloa District, Kaua'i, Hawai'i
Response to Comment on EISPN

Dear Mr. Fuchigami:

Thank you for your input dated February 9, 2015 on the Hawai'i Dairy Farms Environmental Impact Statement Preparation Notice (EISPN). We acknowledge a permit for the transport of oversized and/or overweight materials and equipment on State highway facilities would be required from the DOT Highways Division, Kaua'i District Office.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,
GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

cc: Hawai'i Dairy Farms
Hawai'i State Department of Health,
Environmental Planning Office

OFFICE OF PLANNING
STATE OF HAWAII

235 South Beretania Street, 6th Floor, Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

DAVID Y. IGE
GOVERNOR

LEO R. ASUNCION
ACTING DIRECTOR
OFFICE OF PLANNING

Telephone: (808) 587-2846
Fax: (808) 587-2824
Web: http://planning.hawaii.gov/

Ref. No. P-14653

February 18, 2015

RECEIVED
FEB 20 2015
GROUP 70 INTL

Mr. Jeffrey H. Overton, AICP, LEED, AP
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813

Dear Mr. Overton:

Subject: Environmental Impact Statement Preparation Notice, Hawaii Dairy Farms, TMK: (4) 2-9-003:001 (portion); (4) 2-9-001:001 (portion)

Thank you for the opportunity to provide comments on the Environmental Impact Statement Preparation Notice (EISPN) for the Hawaii Dairy Farms, which was transmitted to our office by letter dated January 21, 2015. It is our understanding that this proposal intends to establish and operate a dairy farm in the Koloa district on the island of Kauai. It plans to utilize a sustainable, pasture-based rotational grazing system. This dairy farm will rely on grass produced on Kauai, instead of using imported feed for the milking cows. The dairy farm will be self-sustainable and will be a zero-discharge facility (no release of harmful cow manure into the environment). The proposed Draft Environmental Impact Study (Draft EIS) will evaluate alternatives that meet the project's purpose and need, and will consider changes to farm operation and location. The primary objective of this project is to establish a facility that produces fresh, locally made, nutritious milk for Hawaii families.

The Office of Planning (OP) has reviewed the EISPN and have the following comments to offer:

1. OP provides technical assistance to state and county agencies in administering the statewide planning system in Hawaii Revised Statutes (HRS) Chapter 226, the Hawaii State Plan. The Hawaii State Plan provides goals, objectives, priorities, and priority guidelines for growth, development, and the allocation of resources throughout the State, and includes diverse policies and objectives of state interest including but not limited to the economy, agriculture, the visitor industry, federal expenditure, the physical environment, facility systems, socio-cultural advancement, climate change adaptation, and sustainability.

   The Draft EIS should include an analysis on the Hawaii State Plan, HRS Chapter 226, in a section that addresses whether this project conforms or is in conflict with state

and county plans, policies, and controls. The analysis should include a discussion on the project's ability to meet the objectives and policies listed in HRS Chapter 226.

2. OP is the lead agency for the Hawaii Coastal Zone Management Program. The coastal zone management area is defined as "all lands of the State and the area extending seaward from the shoreline to the limit of the State's police power and management authority, including the U.S. territorial sea" see HRS § 205A-1 (definition of "coastal zone management area").

   The Draft EIS should include a statement that discusses the proposed project's ability to meet the objectives and policies set forth in HRS § 205A-2. This statement should be included in a section of the Draft EIS that examines how this project conforms or is in conflict with state and county plans, policies, and controls. Where a conflict or inconsistency exists with the Hawaii CZM objectives and policies, the statement must describe the extent to which the applicant has reconciled its proposed action with HRS § 205A-2. These objectives and policies include: recreational resources, historic resources, scenic and open space resources, coastal ecosystems, economic uses, coastal hazards, managing development, public participation, beach protection, and marine resources.

3. Although not listed in Section 5.0, page 5-1 of the EISPN, it appears portions of the parcel planned for dairy farm and grass pasture use may lie within the Special Management Area (SMA) delineated by the County of Kauai. The planning departments of the various county administrations are charged with assessing the requirements for SMA use. Please confirm with the County of Kauai's Planning Department to make a determination on where the project lies in relation to the designated SMA, and whether a SMA permit is required for this project.

4. The parcel area chosen for this project is within a relatively close distance of coastal and marine resources including the coastline, the Kipu Kai watershed, and a riverine wetland system. Additionally, because of the wet and periodic stormy climate of the Koloa district, coastal pollution is a concern. Pollution runoff, and in particular the vegetated treatment systems that may be employed in grass pasture growth and dairy milk production, may have nonpoint pollution impacts on Kauai's coastal resources. The Draft EIS should include an analysis of the proposed management control methods for mitigating pollution runoff. For guidance, please review the Hawaii Watershed Guidance, which provides information on management measures that may be implemented to minimize coastal nonpoint pollution. Specifically Section 5.1, pages 73-80, covers management measures for confined animal facilities, manure and runoff storage, grazing, and irrigation waters. The Watershed Guidance can be

viewed or downloaded from the Office of Planning website at http://files.hawaii.gov/dbedt/op/czm/initiative/nonpoint/HI Watershed Guidance Final.pdf.

5. OP's Special Plans Branch is the lead program for the preparation of the Hawaii Comprehensive Economic Development Strategy (CEDS). One of the major goals of the 2010 CEDS, was increased food security and energy self-sufficiency. An October 2012 CEDS State Strategic/Functional Plan study, "Increased Food Security and Food Self-Sufficiency Strategy," detailed the importance of increasing local food production intended for local consumers. The Draft EIS should include an analysis of the project's consistency with this food self-sufficiency strategy. The food security and self-sufficiency strategy can be viewed or downloaded from the Office of Planning website at http://files.hawaii.gov/dbedt/op/spb/INCREASED_FOOD_SECURITY_AND_FOOD_SELF_SUFFICIENCY_STRATEGY.pdf.

If you have any questions regarding this comment letter, please contact Josh Hekekia of our office at (808) 587-2845.

Sincerely,

Leo R. Asuncion
Acting Director

GROUP 70
INTERNATIONAL

PRINCIPALS

Francis S. Oda, Arch.D., FAIA, AICP, LEED AP
Norman G.Y. Hong AIA
Sheryl B. Seaman AIA, ASID, LEED AP
Roy H. Nihei AIA, CSI, LEED AP
James I. Nishimoto AIA
Stephen Yuen AIA
Linda C. Miki AIA
Charles Y. Kaneshiro AIA, LEED AP
Jeffrey H. Overton AICP, LEED AP
Christine Mendes Ruotola AICP, LEED AP
James L. Stone, Arch.D., AIA, LEED AP
Katherine M. MacNeil AIA, LEED AP
Tom Young, MBA AIA
Paul T. Matsuda PE, LEED AP
Ma Ry Kim RIBA, ARB
Craig Takahata AIA

OF COUNSEL

Ralph E. Portmore FAICP
Hitoshi Hida AIA

May 26, 2016

Mr. Leo R. Asuncion
Director
State of Hawai'i
Office of Planning
Post Office Box 2359
Honolulu, Hawai'i 96804

Subject: Hawai'i Dairy Farms Environmental Impact Statement (EIS)
Preparation Notice
Māhā'ulepū, Kōloa District, Kaua'i, Hawai'i
Response to Comment on EISPN

Dear Mr. Asuncion:

Thank you for your input dated February 18, 2015 on the Hawai'i Dairy Farms Environmental Impact Statement Preparation Notice (EISPN). We acknowledge your comments and provide the responses below.

1. Hawai'i State Plan. Compliance with the Hawai'i State Plan is described in the Draft EIS Chapter 5, Plans and Policies. Sections of Hawai'i Revised Statutes (HRS) Chapter 226 supported by the Hawai'i Dairy Farms project are indicated in Table 5-2 of the Draft EIS Section 5.3. The project conforms with applicable sections of HRS Chapter 226.

2. Coastal Zone Management Program. Hawai'i Dairy Farms is located within the CZMA. The project improvements are designed to conform to the goals, policies, and objectives of HRS Sect. 205A-2 Hawai'i's CZM Program. The Dairy Farm is consistent with CZMA programs and policies to protect coastal lands and waters, including significant measures to minimize or mitigate potential non-point source pollution impacts to the aquatic resources and nearshore coastal waters. Additional information on these mitigation measures is presented in Draft EIS Chapters 3 and 4.

3. Special Management Area (SMA). The Special Management Area (SMA) permitting system is part of the CZM Program approved by Federal and State agencies. When CZM first became law in 1975, the legislature established the SMA regulatory function at the county level, and the Kaua'i Planning Commission is the authoritative agency in the County of Kaua'i. Based on County of Kaua'i SMA maps of the region, the dairy site area is located outside the Special Management Area. Refer to Figure 4.4-2 in the Draft EIS.

4. Coastal and Marine Resources. In compliance with Federal and State Clean Water regulations, HDF will institute appropriate controls and procedures to manage stormwater during construction, and to minimize potential non-point pollution in stormwater run-off. Both management controls and structural controls will be implemented in the short-term. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural

controls; prohibiting leaking or poorly-maintained construction equipment and machinery; and keeping adjacent public, paved streets free of dirt and mud. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Long-term operational measures for the dairy include vegetative buffers totaling 70 feet in width – 35 feet on either side measured from the top of the agricultural ditches. Buffers will be established in keeping with NRCS Conservation Practices to improve and maintain water quality and reduce erosion. Fences will be erected along the 35-foot setbacks to exclude cows from the buffer areas; vegetation along the buffer will trap soil particles and organic debris in order to minimize inputs to stormwater runoff. Vegetation in and adjacent to the ditches will be maintained to control overgrowth and minimize ditch bank soil erosion.

Further, effluent irrigation will not occur within 50 feet of the ditches. A long-term water quality monitoring program will be instituted to regularly sample and analyze nutrient and bacteriological levels of the surface waters (agricultural ditches and Waiopili Ditch). The monitoring program and methods will be established to meet the CWB quality assurance/quality control requirements. Data from the surface water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kaua'i community.

As discussed in Draft EIS Sections 4.17 and 4.23, Marine Resources Consultants Inc. completed a Surface Water Quality and Marine Assessment to assess potential impacts from the dairy operations. There will be no adverse long term effects to water quality of the marine environment. The report is included as Appendix F in the Draft EIS.

5. Food Security and Self Sufficiency. The October 2012 Comprehensive Economic Development Strategy State Strategic/Functional Plan study "Increased Food Security and Food Self-Sufficiency Strategy" was instrumental to the sustainable pasture-based rotation dairy project. Between 1984 and 2015, importation of milk to Hawai'i rose from 0 to 90 percent. Conventional feedlot dairy operations face management challenges including costs of imported feed which fluctuate with grain and fuel prices, and the need to store manure in waste impoundment lagoons as a waste product. The pastoral-based dairy utilizes a system to balance needs of the forage (grass) with nutrients provided by manure produced on site.

Hawai'i Dairy Farms' objectives include providing more than 1 million gallons annually of fresh, nutritious milk for Hawai'i families. This will reduce reliance on imported milk from the mainland U.S. With demonstration of the pasture-based system as an economically and environmentally sustainable model for Hawai'i, HDF will contemplate the possibility of expanding the herd in the future for even greater annual production.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,
GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

cc: Hawai'i Dairy Farms
Hawai'i State Department of Health,
Environmental Planning Office

DAVID Y. IGE
Governor

SHAN S. TSUTSUI
Lt. Governor

COPY

SCOTT E. ENRIGHT
Chairperson, Board of Agriculture

PHYLLIS SHIMABUKURO-GEISER
Deputy to the Chairperson

State of Hawaii
DEPARTMENT OF AGRICULTURE
1428 South King Street
Honolulu, Hawaii 96814-2512
Phone: (808) 973-9600 FAX: (808) 973-9613

February 25, 2015

Dr. Virginia Pressler, M.D., Director
Department of Health
P. O. Box 3378
Honolulu, Hawaii 96801-3378

Dear Dr. Pressler:

Subject: Environmental Impact Statement Preparation Notice
Hawaii Dairy Farms
TMK: 2-9-03: por. 1, por. 6
2-9-01: por. 1
Poipu, Kauai
Area: 579 acres

The Department of Agriculture (DOA) has reviewed the subject document (EISPN) and offers the following comments.

Hawaii Dairy Farms, LLC seeks to establish and operate the first zero-discharge, grass-fed dairy in Hawaii, utilizing a sustainable, pasture-based rotational grazing system on an approximately 578-acre farm at Mahaulepu, Kauai. The irrigated pasture will be the primary food source and 100 percent of the manure produced will remain on the farm as fertilizer for the pasture grass.

Proposed Action

Following EIS review, the applicant will construct the buildings and support structure over a 10 month period, followed by populating the facility with up to 699 dairy cows. Dairy operations with cow populations in excess of 700 head require additional regulatory review.

The proposed dairy appears to be entirely within the 1,533 acres of Important Agricultural Lands (IAL) designated by the Land Use Commission on May, 2011. We recommend the EIS discuss the relationship of the proposed dairy with other existing and proposed agricultural uses within the Mahaulepu area with respect to land use, adequacy of water supply and quality, and other issues that may arise as the dairy establishes then expands its operations. Also, we note that the Mahaulepu IAL map (attached) shows a group of lots along the northeastern corner of Mahaulepu Road that

Island Fresh

do not appear in the project location map (Application, Figure 1.1, page 1-3). The status and relationship of these lots to the proposed dairy should be discussed.

Required Reviews, Permits and Approvals

The EISPN notes that there are rules of the DOA that the facility has to comply with (page 2-4). The existing reference should be corrected as follows:

- Compliance with Rules for ~~Livestock Facilities~~ Milk Producers and application for a Milk Producer License.

Terrestrial Environment

Surface water and ground water resources (page 3-2)
See our comment on water resources under Proposed Action.

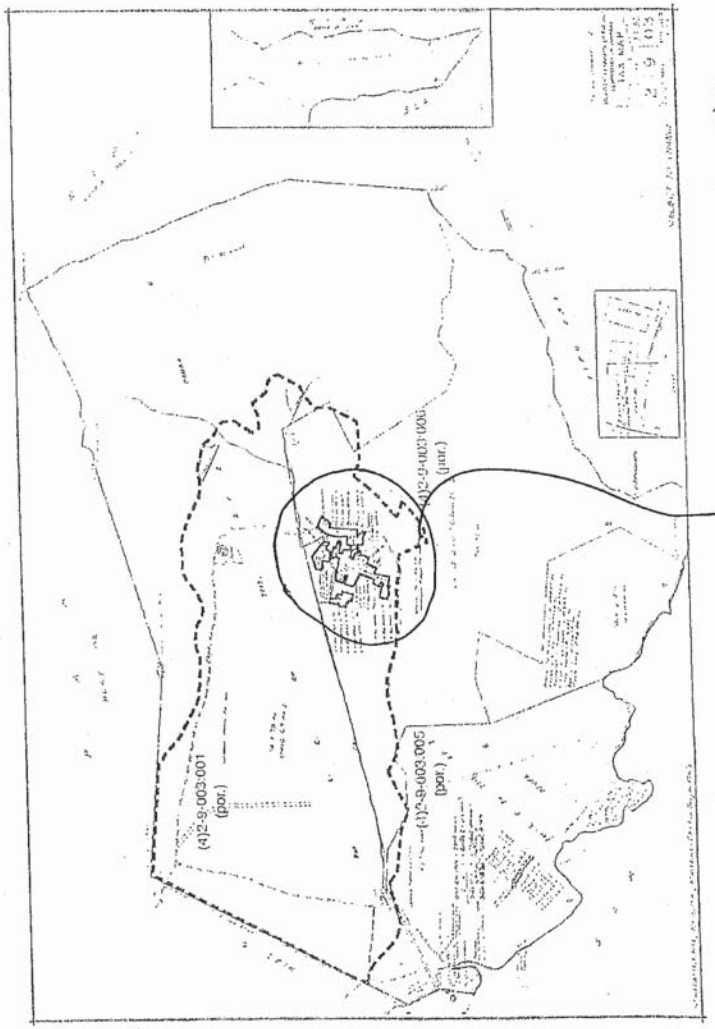
Thank you for the opportunity to review and provide comments on this very important project that promises to improve the State's self-sufficiency in fresh milk production and increase the productive use of the State's Important Agricultural Lands. Should you have any questions, please contact Earl Yamamoto at 973-9466, or email him at earl.j.yamamoto@hawaii.gov.

Sincerely,

Scott E. Enright, Chairperson
Board of Agriculture

Attachment: TMK map

c: Milk Control Section-Quality Assurance Division, DOA
Hawaii Dairy Farms, LLC



Unknown land parcels within Hawaii Dairy Farms proposed site

May 26, 2016

Mr. Scott E. Enright
Chairperson
Board of Agriculture
State of Hawai'i
Department of Agriculture
1428 South King Street
Honolulu, Hawaii 96814-2512

Subject: Hawai'i Dairy Farms Environmental Impact Statement (EIS) Preparation Notice
Māhā'ulepū, Kōloa District, Kaua'i, Hawai'i
Response to Comment on EISPN

Dear Mr. Enright:

Thank you for your input dated February 25, 2015 on the Hawai'i Dairy Farms Environmental Impact Statement Preparation Notice (EISPN).

1. Important Agricultural Lands. We acknowledge your recommendations that the Draft EIS discuss the relationship of the proposed dairy with other existing and proposed agricultural uses and surrounding lots within Māhā'ulepū and the surrounding region.

Properties immediately surrounding the HDF site are in agricultural use. Several single-family farm lot dwellings are located approximately one mile west of the dairy site's southwestern corner. The large tracts of farmland with a regional water system such as that maintained by Mahaulepu Farm and Grove Farm, allow for stability in support of farm ventures while providing local residents with a reliable source of employment.

The long-term operation of HDF will be in full compliance with its agricultural State Land Use District designation, and embodies the IAL designation per the Hawai'i State Constitution by using the protected lands in the project area with high quality agricultural soil for their intended purpose of diversified agriculture and agricultural self-sufficiency. HDF will work with surrounding agriculture uses to provide long-term benefit and support of agricultural lands and industry through continued use in keeping with zoning and IAL designation.

Long-term groundwater supply impacts are not anticipated to be significant. Total potable water demand is approximately 30,000 gpd (0.03 MGD) for the committed proposed action herd size of up to 699 mature dairy cows. Should HDF decide, in the future, to increase the herd to up to 2,000 mature dairy cows, potable water demand will total 84,800 gpd (0.085 MGD). The potable water well located on the HDF site provided 3 MGD during the sugarcane plantation era. The demand of approximately 30,000 gallons per day (0.03 MGD) for potable water is well within the capacity of the existing Māhā'ulepū 14 well source. Additional groundwater resource information is presented in Draft EIS Section 4.16.

Non-potable water will be sourced from Waita Reservoir. Irrigation demand, the primary use of non-potable water, is estimated conservatively for planning purposes at 2.26 million gallons per day.

2. Compliance with Rules for Milk Producers and Application for a Milk Producers License. We also acknowledge the Department of Agriculture reference that has been correctly revised to the Compliance with rules for *Milk Producers and application for a Milk Producer License*. HDF will comply with the rules and obtain the proper license.

3. Water Resources. The Draft EIS hydrologic assessment determined that the modest potable water demand from the dairy operation, and the distances between the Māhā'ulepū 14 well and the County's Kōloa F well will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Further, the assessment determined there is no hydrologic connection between the aquifer layer deep in the unweathered volcanic series (which is the source of potable water) and the shallow groundwater located within the alluvial material under the valley floor. Groundwater in the alluvium will not impact the County drinking water well.

Over the long-term, the surface water quality in the agricultural ditches and Waiopili Ditch will be improved by active management of the dairy site. Cultivation of a grass thatch for complete vegetative cover throughout the dairy paddocks will minimize currently exposed soils within the site.

Vegetative buffers totaling 70 feet in width – 35 feet on either side measured from the top of the agricultural ditches – will be established in keeping with NRCS Conservation Practices to improve and maintain water quality and reduce erosion. Fences will be erected along the 35-foot setbacks to exclude cows from the buffer areas; vegetation along the buffer will trap soil particles and organic debris in order to minimize inputs to stormwater runoff. Vegetation in and adjacent to the ditches will be maintained to control overgrowth and minimize ditch bank soil erosion. Additional effluent application setbacks totaling 100 feet in width – 50 feet from the top of either side of a waterway – will keep nutrient applications away from waterways.

Vegetation and stream flow in the areas downstream of the dairy site are beyond the control of the dairy operation. Mahaulepu Farm's agricultural tenants have responsibilities to maintain farm lands and vegetation growth along ditches to allow channel flow during peak stormwater runoff events. Suspended soils inputs from natural sources and off-site ranching and agricultural uses in the watershed will continue to enter the agricultural ditches, which drain downstream into Waiopili Ditch and the nearshore ocean waters.

A long-term water quality monitoring program will be instituted to regularly sample and analyze nutrient and bacteriological levels of the surface waters (agricultural ditches and Waiopili Ditch). The monitoring program and methods will be established to meet the CWB quality assurance/quality control requirements. The

ongoing testing program will provide feedback to the dairy management team regarding nutrient uptake and to monitor whether bacteriological constituents in the area reach levels of environmental concern. Data from the surface water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kaua'i community.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,
GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

cc: Hawai'i Dairy Farms
Hawai'i State Department of Health,
Environmental Planning Office

PHONE (808) 594-1888

FAX (808) 594-1938

STATE OF HAWAI'I
OFFICE OF HAWAIIAN AFFAIRS
560 N. NIMITZ HWY., SUITE 200
HONOLULU, HAWAI'I 96817

HRD15-7339B

February 26, 2015

Jeff Overton, Principal Planner
Group 70 International, Inc.
925 Bethel Street, Fifth Floor
Honolulu, HI 96813

Re: Environmental Impact Statement Preparation Notice for the Hawai'i Dairy Farms
Māhā'ulepū Ahupua'a, Kona Moku, Kaua'i Mokupuni
TMK: (4) 2-9-003:001, (4) 2-9-003:006, (4) 2-9-001:001

Aloha e Jeff Overton:

The Office of Hawaiian Affairs (OHA) is in receipt of your January 20, 2015 letter seeking preliminary comments on the above environmental impact statement preparation notice (EISPN), on the development of the 578 acres of agricultural lands in the Māhā'ulepū valley area. Hawai'i Dairy Farms (HDF) is seeking to establish and operate the first zero-discharge, grass-fed dairy in Hawai'i on Important Agricultural Lands (IAL).

Your letter notes that in the 1970s and 1980s, agricultural lands in this area were reclassified from State Agricultural District to Urban District, and rezoned by the County as a resort area. In the 1980s, there was significant development on the coastline of hotels, timeshare condominiums, single-family resort residences, golf courses, and commercial centers. Concerned with the expansion of the coastline and another resort development, the community prompted to protect the last undeveloped agricultural lands. The remaining 1,533 acres of Māhā'ulepū coastline was designated and is now classified and protected under IAL, a provision of the Hawai'i State Constitution (Article XI, Section 3).

There are 1,533 acres of lands that is classified by the State land Use Commission as IAL. Of this, 578 acres of IAL are being leased by HDF and proposes to construct facilities for the commercial dairy operation, including a barn and milking parlor, cow walkways and farm

roads, effluent settling and storage ponds, livestock water distribution system, storage tanks, and operations buildings. At full scale operations, the dairy will produce up to 3.7 million gallons annually, which is double the current volume of milk produced in Hawai'i.

According to your letter, expansive early agriculture was established throughout the Kōloa and Māhā'ulepū ahupua'a. Māhā'ulepū became one of the first sites of commercial plantation agriculture in the main Hawaiian Islands. An archaeological inventory survey (AIS) was conducted for the project area and found no significant archaeological or historic sites within the proposed HDF pastures. Also, the AIS was extended beyond the pasture area on the upslope and found a boulder with petroglyphs and habitation and ceremonial feature. In consultation with State Historic Preservation Division, findings will be properly documented and presented in the draft environmental impact statement.

OHA recommends consultation be initiated with the following individuals and community organizations who may be willing to share their mana'o with you:

- Wilma Holi – Cultural Practitioner
- Billy Kaohelauli'i – 'Aha Moku – Kona Moku Representative
- Chipper Wichman – President/CEO National Tropical Botanical Gardens
- Richard Keao Nesmith – Cultural Practitioner
- Randy Wichman – Cultural Historian
- Mālama Māhā'ulepū

We appreciate your efforts to perform the environmental impact statement. OHA suggests that the cultural impact assessment should analyze the impacts and propose mitigation for the project's impacts to nearby Native Hawaiian sites. As this project moves forward, OHA does request assurances that should iwi kupuna or Native Hawaiian cultural deposits be identified during any ground altering activities, all work will immediately cease and the appropriate agencies, including OHA, will be contacted pursuant to applicable law.

Thank you for the opportunity to submit comments on this EISPN and we look forward to reviewing the draft EIS. Should you have any questions, please contact Kathryn Keala at (808) 594-1848 or kathyk@oha.org.

'O wau iho nō me ka 'oia 'i'o,

Kamana'opono M. Crabbe, Ph.D.
Ka Pouhana, Chief Executive Officer

KC:kk

C: Dan Ahuna, OHA Kaua'i & Ni'ihau Trustee
Kaliko Santos, OHA Kaua'i Community Outreach Coordinator *(via email)*

GROUP 70 INTERNATIONAL

May 26, 2016

Mr. Kamana'opono M. Crabbe, Ph.D.
Ka Pouhana, Chief Executive Officer
State of Hawai'i
Office of Hawaiian Affairs
560 N. Nimitz Hwy., Suite 200
Honolulu, Hawaii 96817

Subject: Hawai'i Dairy Farms Environmental Impact Statement (EIS) Preparation Notice
Māhā'ulepū, Kōloa District, Kaua'i, Hawai'i
Response to Comment on EISPN

Aloha Dr. Crabbe:

Thank you for your input dated February 26, 2015 on the Hawai'i Dairy Farms Environmental Impact Statement Preparation Notice (EISPN).

1. Archaeological Inventory Survey. The Hawai'i Dairy Farm project is subject to a historic preservation review by the State Department of Land and Natural Resources, SHPD under HRS Chapter 6E and Chapter 13-284. An archaeological inventory survey (AIS) and a cultural impact assessment were conducted for the proposed project site. Sixteen historic properties were identified, six of which are onsite and associated with sugarcane era plantation. Of the 10 historic sites found in an extended survey area 1,000 feet north of the project area, one newly identified site is believed to be associated with pre-Contact or early historic times. The survey relocated a previously identified pre-contact pohaku with petroglyphs, two pecked cups, and a long etched groove. Two of the sixteen sites have been evaluated as significant under multiple criteria, but both occur outside the project area. No burial sites were found, and no impacts are anticipated for either site outside of the project area.

2. Cultural Impact Assessment. The cultural assessment examined the potential effect of the project on cultural resources, practices or beliefs. As a part of the cultural impact assessment, individuals from different community groups that comprise the multiethnic community of Kaua'i were contacted, including available individuals from the consultation list OHA provided. Those available were interviewed and assessed the potential effects of the dairy on cultural resources in the project area, and recommendations for mitigation of potential effects. Information received from the community indicates the Māhā'ulepū ahupua'a has been and is currently used for traditional cultural purposes. However, the dairy project area has not been included in these activities. Gathering of plants and marine resources, and two known state archaeological sites are outside the project area: State Site 50-30-10-2250, an agricultural heiau; and State Site 50-30-103094, a carved petroglyph boulder. No significant cultural sites occur within the HDF site. There will be no change to current cultural practices within the Māhā'ulepū ahupua'a resulting from the dairy establishment and operations.

Group 70 International • 925 Bethel Street, 5th Floor • Honolulu, HI 96813-4398 • tel. 808.523.5866 • fax. 808.523.5874 • www.group70int.com

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,
GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

cc: Hawai'i Dairy Farms
Hawai'i State Department of Health,
Environmental Planning Office

Department of Water County of Kaua'i

Water has no substitute.....Conserve it

RECEIVED
FEB 23 2015
GROUP 70 INTL

February 20, 2015

Mr. Jeff Overton, Principal Planner
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, HI 96813-4307

Dear Mr. Overton:

Subject: Notice of Preparation of Environmental Impact Statement for Hawaii Dairy Farms, TMK: 2-9-03: por. 1 and por. 6; TMK: 2-9-01: por. 1, Poipu, Kauai

Thank you for the opportunity to comment on the NPEIS for the proposed dairy farm. The Department of Water (DOW) has concerns regarding the possible contamination of our wells located in vicinity of the proposed dairy farm. The DOW would like to recommend that the Applicant perform a comprehensive hydrogeologic study to determine the groundwater contamination potential of the dairy farm activities. The study should include, but shall not be limited to the development of mitigation measures to prevent, monitor, and resolve groundwater contamination.

Thank you for your consideration,

Sincerely,

Kirk Saiki
Manager and Chief Engineer

ED:loo
2-9-03-001 por. & 6 por.; 2-9-01-001 por., T-16796, NPEIS response, Poipu, 2-17-15

4398 Pua Loke St., P.O. Box 1706, Lihue, HI 96766 Phone: 808-245-5400
Engineering and Fiscal Fax: 808-245-5813, Operations Fax: 808-245-5402, Administration Fax: 808-246-8628

May 26, 2016

Mr. Kirk Saiki
Manager and Chief Engineer
County of Kaua'i, Department of Water
4398 Pua Loke St.
P.O. Box 1706
Līhu'e, Hawai'i 96766

Subject: Hawai'i Dairy Farms Environmental Impact Statement (EIS) Preparation Notice
Māhā'ulepū, Kōloa District, Kaua'i, Hawai'i
Response to Comment on EISPN

Dear Mr. Saiki:

Thank you for your input dated February 20, 2015 on the Hawai'i Dairy Farms Environmental Impact Statement Preparation Notice (EISPN).

1. Comprehensive Hydrogeological Study. We acknowledge your comments and have conducted a comprehensive hydrogeological study to determine groundwater potential of the dairy farm activities as part of the Draft EIS.

Tom Nance Water Resources Engineering conducted the groundwater study for the project; the report is enclosed as Draft EIS Appendix E. The assessment determined there is no hydrologic connection between the aquifer layer deep in the unweathered volcanic series (which is the source of potable water) and the shallow groundwater located within the alluvial material under the valley floor. Further, the assessment concludes that the modest potable water demand from the dairy operation, and the distances between the Māhā'ulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

2. Groundwater Study Findings. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. The hydraulic conductivity of permeable flank lavas in the Hawaiian Islands ranges from hundreds to thousands of feet per day, whereas estimates for less permeable dike-intruded lavas range from 1 to 500 feet per day. Permeable lavas, represented by a high hydraulic conductivity, increase the distance contaminated groundwater can travel before pathogens die-off or contaminants can degrade to a point of being benign.

The weathered alluvium of Māhā'ulepū Valley shows a hydraulic conductivity on the order of 10.5 to 50 feet per day, whereas the adjacent soils of the Kōloa -Po'ipū region is on the order of 201 to 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area, allowing the remedial properties of soil and associated bacteria to denitrify or otherwise render potential contaminants inert.

Group 70 International • 925 Bethel Street, 5th Floor • Honolulu, HI 96813-4398 • tel. 808.523.5866 • fax. 808.523.5874 • www.group70int.com

3. Monitoring Wells. Four groundwater monitoring wells installed by HDF into the shallow water aquifer within the alluvium will allow monitoring of water quality. Results from the monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kaua'i community.

4. Farming setback at Kōloa F well. As determined through discussions with the County Department of Water, HDF will not irrigate or graze the lands within a 1,000-foot setback surrounding the Kōloa F County water well. Within this setback, no effluent irrigation water will be applied, no commercial fertilizer will be applied, and no animals will deposit manure.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,
GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

cc: Hawai'i Dairy Farms
Hawai'i State Department of Health,
Environmental Planning Office

COUNTY COUNCIL
Mel Rapozo, Chair
Ross Kagawa, Vice Chair
Mason K. Chock
Gary L. Hooser
Arryl Kaneshiro
KipuKai Kuali'i
JoAnn A. Yukimura

OFFICE OF THE COUNTY CLERK

Ricky Watanabe, County Clerk
Jade K. Fountain-Tanigawa, Deputy County Clerk

Telephone (808) 241-4188
Fax (808) 241-6349
Email cokcouncil@kauai.gov

Council Services Division
4396 Rice Street, Suite 209
Līhu'e, Kaua'i, Hawai'i 96766

February 23, 2015

Department of Health, State of Hawai'i
Attn: Laura McIntyre, Environmental Planning Office
919 Ala Moana Boulevard, Room 312
Honolulu, Hawai'i 96814
(Via E-mail: epo@doh.hawaii.gov)

Dear Ladies and Gentlemen:

RE: ENVIROMENTAL IMPACT STATEMENT PREPARATION NOTICE (EISPN) – HAWAI'I DAIRY FARMS

Thank you for this opportunity to comment on the Environmental Impact Statement Preparation Notice (EISPN) for the proposed Hawai'i Dairy Farms at Māhā'ulepū, Kaua'i. My comments are submitted in my capacity as a Councilmember of the Kaua'i County Council.

I am requesting that the following concerns be addressed in the EIS process:

1. The full impact of the Dairy operation on the quality of near shore waters when operating at full capacity over time.

2. The full impact of the Dairy operation on the availability of irrigation water from nearby reservoirs needed for other future agricultural uses when operating at full capacity over time.

3. The full impact of the Dairy operations with regards to "unintended consequences" such as odor drift to nearby residential and resort operations when operating at full capacity over time.

4. What is "plan B" should there be unintended consequences relating to the above in the future? Will there be any controls or requirements causing the dairy to scale back its operations should significant negative impacts occur?

Thank you for this opportunity to provide comments regarding the Hawai'i Dairy Farms Environmental Impact Statement. Should you have any questions, please do not hesitate to contact me at 241-4188.

Sincerely,

GARY L. HOOSER
Councilmember, Kaua'i County Council

AO:lc
cc: State of Hawai'i, Department of Health
(Via E-mail: Laura.McIntyre@doh.hawaii.gov)
Group 70 International, Inc. (Via E-mail: HDF@Group70int.com)
Hawai'i Dairy Farms, LLC., P.O. Box 1690, Kōloa, Hawai'i 96756-1690

GROUP 70
INTERNATIONAL

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Paul T. Matsuda PE, LEED AP
Ma Ry Kim RIBA, ARB
Craig Takahata AIA

OF COUNSEL

Ralph E. Portmore FAICP
Hitoshi Hida AIA

May 26, 2016

Mr. Gary Hooser
Councilmember
County of Kaua'i
Kaua'i County Council
4396 Rice Street, Suite 209
Līhu'e, Hawai'i 96766

Subject: Hawai'i Dairy Farms Environmental Impact Statement (EIS) Preparation Notice
Māhā'ulepū, Kōloa District, Kaua'i, Hawai'i
Response to Comment on EISPN

Dear Councilmember Hooser:

Thank you for your input dated February 23, 2015 on the Hawai'i Dairy Farms Environmental Impact Statement Preparation Notice (EISPN). We acknowledge your comments and provide the following responses.

1. Nearshore Ocean Water Quality. A Sanitary Survey prepared for the Māhā'ulepū sub-watershed by the State of Hawai'i Department of Health Clean Water Branch describes the Waiopili Ditch as a man-made drainage on private property, and further notes that it is not an inviting recreational body of water utilized by people. The Sanitary Survey found no significant impact to the Waiopili Ditch from any activity that can be attributed to the dairy.

Marine Research Consultants, Inc. (MRCI) collected baseline data on biological and chemical constituents within surface waters and open ocean coastal waters downgradient of the HDF site. The baseline conditions are part of a water quality monitoring program to be established by HDF for groundwater, surface waters and nearshore marine waters. A groundwater engineering firm assessed potential impacts of nutrients from the proposed dairy operation. MRCI utilized the findings of the groundwater assessment to look at potential impacts to the nearshore ocean water quality. The two studies are appended to the Draft EIS.

The groundwater body in the alluvium is hydrologically disconnected from the County well water in deep unweathered volcanics. Episodic, seasonal rainfall events cause groundwater in the alluvium to rise and intersect with the deep agricultural ditches in the vicinity of HDF monitoring wells 1 and 2. Such episodes are calculated to average 10 days annually, which would result in a modest amount of groundwater containing nutrients to discharge into the surface ditches. The amount of nutrients estimated from HDF operations released to surface water is calculated at 10,000 pounds of nitrogen and 900 pounds of phosphorus annually.

An estimate of nitrogen input to the marine environment from resort landscaping fertilization and domestic wastewater in the Poi'pū region is calculated to be 38,510 pounds of nitrogen annually. This is 3.8 times greater than the estimate from dairy operations. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. Significantly different soils mean that nutrient inputs from the Poi'pū region are constant throughout the year, and no mitigation is applied to reduce the quantities.

The terminus of Waiopili Ditch is a deep, muddy basin that joins the ocean through a channel cut through beach sand. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline. Comparing the surface water samples to those taken in nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. Typical oceanographic conditions of tradewind generated seas and long-period swells breaking on the reef platform result in rapid mixing and dilution of ditch water constituents within a narrow zone that only extends several meters from the shoreline. As a result, input from ditch water is highly restricted in terms of effects to the marine environment. MRCI concluded there will be no substantial effects to marine water quality from the HDF dairy.

In compliance with national and State Clean Water regulations, HDF will institute appropriate controls and procedures to manage stormwater during construction, and to minimize the potential for non-point pollution in stormwater run-off. Both management controls and structural controls will be implemented in the short-term. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; prohibiting leaking or poorly-maintained construction equipment and machinery; and keeping adjacent public, paved streets free of dirt and mud. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

An ongoing water quality monitoring program will be instituted to regularly sample and analyze nutrient levels of the surface waters (agricultural ditches and Waiopili Ditch). The monitoring program and methods will be established to meet the State Department of Health Clean Water Branch (DOHCWB) quality assurance/quality control requirements. The ongoing testing program will provide feedback to the dairy management team regarding nutrient uptake and to monitor whether bacteriological constituents in the area reach levels of environmental concern. Data from the surface water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kaua'i community.

2. Agricultural Water Supply. Total potable water demand is approximately 30,000 gpd (0.03 MGD) for the committed proposed action herd size of up to 699 mature dairy cows. Should HDF decide, in the future, to increase the herd to up to 2,000 mature dairy cows, potable water demand will total 84,800 gpd (0.085 MGD). The potable water well located on the HDF site provided 3 MGD during the sugarcane plantation era. The demand of approximately 30,000 gallons per day (0.03 MGD) for potable water is well within the capacity of the existing Māhā'ulepū 14 well source. Additional groundwater resource information is presented in Draft EIS Section 4.16.

Non-potable water will be sourced from Waita Reservoir. Irrigation demand, the primary use of non-potable water, is estimated conservatively for planning

purposes at 2.26 million gallons per day. The allotment of Waita Reservoir water to HDF is 3 MGD.

3. Odor Nuisance. Odor refers to the combined effects of a mixture of gases on the sense of smell. Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF. Air dispersion models were used to determine potential odor levels based on the dairy facility design and established modeling methods. Local weather data was used in conjunction with the AERMOD (version 1) modeling system to evaluate odors documented for dairy heifers and effluent ponds.

Modeling results mapped an odor isopleth which displays the area in which odor may be detected by 50 percent of the sensitive population 44 hours out of every year. The extent of detectable odors for the committed herd size of 699 mature dairy cows may extend up to 1,670 feet south of the site under the worst case scenario when winds are light. Should HDF decide in the future to increase the herd size up to 2,000 mature dairy cows, the isopleth extends to 2,780 feet south of HDF. This would reach into the adjoining farm lands, but remains far from resort and residential areas.

The modeling considers the worse-case meteorological conditions, so it is likely odor detection beyond the HDF boundaries will be less frequent. Best Management Practices to reduce odor impacts include establishment of a windbreak. Windbreaks, also known as shelterbelts, are used for a variety of purposes including reduction and interception of airborne odors. For additional analysis, please see Draft EIS Section 4.19.

4. Operational Safeguards. HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future.

For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. The application process for a National Pollutant Discharge Elimination System (NPDES) Concentrated Animal Feeding Operation (CAFO) permit includes public notification and input. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

Nutrient management is the practice of managing the amount, rate, source, method of application, and timing of plant nutrients and soil amendments. The NRCS Conservation Practice Standard 590 (referred to as Standard 590), Nutrient

Management, is applied to commercial fertilizers, organic by-products, waste water, organic matter, and irrigation water. The timing and application of nutrients should correspond as closely as practical with plant uptake, soil properties and weather conditions.

The NMP is an adaptive management tool. Sometimes described as a "living, breathing document," the nutrient conditions are constantly monitored and the NMP will be updated as conditions on the dairy mature. The results from soil testing, manure testing, and forage testing will be utilized to update and inform the carrying capacity of the site, which in turn determines the number of mature dairy cows that can be sustained at the Māhā'ulepū site. Tests will be performed annually at a minimum, and more frequent as needed to assist with nutrient management on the farm.

Increases in nutrients as a result of dairy establishment or operations can inform modification of the operation's nutrient management. Modifications to the timing and placement of effluent can be made; the rate of application can changed; different crops can be utilized to increase uptake by plants; and the number of cows can be changed. Nutrient management is a dynamic process that is informed by monitoring a number of parameters; the ability to monitor nearby water bodies for changes in nutrients is an additional check that provides data to be publically shared.

A long-term water quality monitoring program has been instituted to regularly sample and analyze nutrient and chemical constituent levels of the shallow groundwater in the alluvium under the HDF site, the surface waters (agricultural ditches and Waiopili Ditch), and the nearshore marine environment downgradient of the HDF site. The monitoring program and methods will meet the CWB quality assurance/quality control requirements. The ongoing testing program will provide feedback to the dairy management team regarding changes in water quality. Data from the water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kaua'i community.

The potential for environmental accidents at the dairy farm will be minimal. Reviews and approvals are required from the State Department of Health for the waste management facilities. Standards and regulatory requirements must be met, and capacity beyond the required volumes has been added to provide additional backup storage. A secondary containment system has been designed as an additional safeguard. Risks to surface water quality are minimized with application of best management practices including vegetated buffer zones and 35-foot setbacks to exclude cows from farm drainageways. Effluent irrigation will not occur within 50 feet of agricultural ditches on the farm. Fuels and chemicals utilized at the dairy facilities will be used and stored following established rules and protocols.

Best management practices include setbacks to minimize impacts to waterways. HDF will not graze cows or apply effluent within 1,000-feet of the Kōloa F well, in agreement with the County Department of Water. Throughout the HDF site,

effluent application setbacks totaling 100 feet in width – 50 feet from the top of either side of a waterway – will keep nutrient applications away from waterways. Vegetative buffers totaling 70 feet in width – 35 feet on either side measured from the top of the agricultural ditches – will be to improve and maintain water quality and reduce erosion. Fences will be erected along the 35-foot setbacks to exclude cows from the buffer areas; vegetation along the buffer will trap soil particles and organic debris in order to minimize inputs to stormwater runoff. Vegetation in and adjacent to the ditches will be maintained to control overgrowth and minimize ditch bank soil erosion.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,
GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

cc: Hawai'i Dairy Farms
Hawai'i State Department of Health,
Environmental Planning Office

Bernard P. Carvalho, Jr.
Mayor

Nadine K. Nakamura
Managing Director

DEPARTMENT OF PUBLIC WORKS
County of Kaua'i, State of Hawai'i
4444 Rice Street, Suite 275, Līhu'e, Hawai'i 96766
TEL (808) 241-4992 FAX (808) 241-6604

Larry Dill, P.E.
County Engineer

Lyle Tabata
Deputy County Engineer

RECEIVED
MAR - 9 2015
GROUP 70 INTL

February 27, 2015

Mr. Jeffery Overton
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, Hawai'i 96813-4307

SUBJECT: Hawaii Dairy Farms
Environmental Impact Statement Preparation Notice (EISPN)
Hawaii Dairy Farms, LLC – Applicant
TMK: (4) 2-9-003: Por. 001 & Por 006; (4) 2-9-0001: Por 001
Koloa District, Island of Kaua'i **PW 01.15.199**

Dear Mr. Young:

The Engineering Division of the Department of Public Works has reviewed the subject EISPN dated January 21, 2015 and offers the following comments:

1. Grading and Grubbing. Grading and grubbing operations shall be conducted in accordance with the County's Grading Ordinance No. 808, an Ordinance Regulating and Controlling Grading, Grubbing, Stockpiling and Soil Erosion and Sedimentation Within the County of Kaua'i.

2. Roadways and Traffic. As noted in the EISPN, current traffic conditions, construction traffic, and operational traffic shall be presented in the Draft Environmental Impact Statement (DEIS). The EISPN refers to Kōloa Bypass Road; in the DEIS and other documents, this road should be referred to as Ala Kinoiki as it is currently named.

3. Drainage and Storm Water Runoff. Pre-development drainage flow volumes and drainage flow patterns must be maintained. The applicant is required to address any increase in storm water runoff generated from the proposed improvements and mitigate drainage impacts in compliance with the County's Storm Water Runoff System Manual.

Thank you for providing this opportunity for consultation on this pending project. We look forward to receipt of the DEIS. If you have any questions or need additional information, please contact Stanford Iwamoto, Engineering Division at (808) 241-4896.

Very truly yours,

MICHAEL MOULE, P.E.
Chief, Engineering Division

MM/SI

Copy: DPW-Design & Permitting

GROUP 70
INTERNATIONAL

May xx, 2016

Mr. Michael Moule, P.E.
Chief, Engineering Division
County of Kaua'i
Department of Public Works
4444 Rice Street, Suite 275
Lihue, HI 96766

Subject: Hawai'i Dairy Farms Environmental Impact Statement (EIS) Preparation Notice
Māhā'ulepū, Kōloa District, Kaua'i, Hawai'i
Response to Comment on EISPN

Dear Mr. Moule:

Thank you for your input dated February 27, 2015 on the Hawai'i Dairy Farms Environmental Impact Statement Preparation Notice (EISPN). We acknowledge your comments and provide the following responses.

1. Grading and Grubbing. HDF acknowledges that its grading and grubbing operations are to be conducted in accordance with County Grade Ordinance No. 808. Specific plans for best management practices will be implemented to minimize soil erosion and sedimentation.

2. Roadways and Traffic. Traffic analysis of the site and region is presented in Draft EIS Section 4.18 – Roadways and Traffic. On average, traffic in the region is generally lower than most urban areas in the State due to the low population of Kaua'i and rural agricultural demographics of the Māhā'ulepū area. Traffic operations along Māhā'ulepū Road and traffic movements at the project driveways are expected to operate at acceptable levels of service during peak hours of traffic. A total of five employees will be working at the dairy facility when built out, generating 12 additional vehicle trips per day, primarily during weekday morning and afternoon commute periods at the committed 699 herd size, with 23 additional vehicle trips per day, primarily during weekday commute periods at the contemplated 2000 herd size. These additional trips will have a minimal effect on traffic conditions at County roadways in the surrounding area, increasing the total volume of Māhā'ulepū Road and Ala Kinoiki Road by no more than 0.2% daily.

3. Drainage and Storm Water Runoff. Drainage flow volume impacts are discussed in Draft EIS Section 4.17 Surface Water Resources. Storm water runoff mitigation measures will be in compliance with County requirements, including the County's Storm Water Runoff System Manual. Over the long-term, the surface water quality in the agricultural ditches and Waiopili Ditch will be improved by active management of the dairy site. Cultivation of a grass thatch for complete vegetative cover throughout the dairy paddocks will minimize exposed soils within the site.

4. Farming Setback. As determined through discussions with the County Department of Water, HDF will not irrigate or graze the lands within a 1,000-foot

setback surrounding the Kōloa F County water well. Within this setback, no effluent irrigation water will be applied, no commercial fertilizer will be applied, and no animals will deposit manure.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,
GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

cc: Hawai'i Dairy Farms
Hawai'i State Department of Health,
Environmental Planning Office

Organizations

February 23, 2015

Jeffrey H. Overton, AICP, LEED AP
Principal Planner
Group 70 International, Inc.
925 Bethel Street, Fifth Floor
Honolulu, HI 96813

Dear Mr. Overton:

This statement will outline the numerous reasons why Grove Farm strongly supports the Hawaii Dairy Farm (HDF) project. Since the exit from sugar cane cultivation and processing, Grove Farm has over 200 existing lease agreements with farmers, ranchers, and other businesses. We have been longtime stewards of our water resources and land responsibilities. Thus, considerable and careful thought went into the site selection for HDF's lease location.

In 2010, Grove Farm, along with a consortium of organizations such as Kamehameha Schools, Parker Ranch, and Maui Land & Pineapple, conducted grass trials statewide to find suitable locations for a grass-fed dairy. Two years of grass trials studies were conducted across various landholdings and Kaua'i was selected because of the contiguous nature of the area, its Important Agricultural Land (IAL) designation and its optimal growing conditions.

In addition to being over 2 miles away from the nearest residential area, the area was used for decades for a number of cattle operations. Contrary to what has been misrepresented by activist groups, the dairy will be located primarily within the Maha'ulepu Valley, and not along the coastline.

Lands within the Maha'ulepu ahupua'a were first used to grow sugar cane over a century ago. When sugar operations ceased back in the 1990's, long-time residents may recall that Grove Farm leased the area to a number of cattle ranchers for many decades with no ill effects and no complaints from anyone in the area.

The area has an abundance of good soil, ample sunlight and a valuable water resource with the adjacent Waita Reservoir, which Grove Farm has continued to maintain even though sugar operations ceased in the 1990's.

While sugar cultivation faded away decades ago, Grove Farm has proactively continued to invest in dam maintenance, as well as the entire reservoir area. Built over 100 years ago, Waita has been an invaluable water resource on the South Shore. Every year, it conserves millions of gallons of precious water. Waita's water currently supports operations at the Haraguchi taro farm, Makauwahi Cave Reserve, other agricultural tenants, as well as the primary source for the Poipu Bay Golf Course's irrigation system.

Although Maha'ulepu was considered for development back in the 1970's, during the height of development on Kaua'i, those plans were never finalized. In 2011, we instead decided to designate the Maha'ulepu Valley as Important Agricultural Lands (IAL). We voluntarily designated the area as IAL in an effort to help preserve and protect Hawaii's farming industry. Grove Farm strongly believed that the people of Kaua'i would prefer to have thriving agriculture in the area rather than see the development of hotels or golf courses.

It is important to note that while a 15% "up zoning" credit is included as an incentive to landowners - which allowed for the reclassification of up to 15% of the acreage protected for other uses, such as rural, urban or conservation – we waived our right to claim this benefit.

Grove Farm has recently been accused by activist groups of not treating the area with respect and cultural sensitivity. It is puzzling that activist groups who oppose change and development in the area oppose farming in that area since it has been used for cattle ranching and agriculture for decades.

Many Kaua'i residents may recall the odor problems associated with the traditional model of confined dairy operations – such as those that existed in Waimea and Moloa'a several decades ago. However, HDF will not be using that model. To be clear, comparing confinement dairy operations with grass-fed dairy operations is like comparing apples to oranges.

Prior to entertaining the possibility of a 20-year lease, we believed that additional due diligence entailed seeing first-hand the type of New Zealand operation that was envisioned for Kaua'i. An executive member of our leadership team flew to New Zealand to tour multiple grass-fed dairy operations and observe industry best practices.

While New Zealand did initially encounter a range of different environmental and regulatory impacts decades ago, such mistakes prompted the industry as a whole to change. In 2002, the New Zealand dairy industry made a commitment

to improve dairy farms' environmental performance with the Clean Streams Accord. New Zealand is now a world-leader in dairy technologies and accounts for over one third of international dairy trade each year. These best practices and sustainable practices will be utilized at the HDF site in Maha'ulepu.

Grove Farm has been a good steward of the land for many decades, allowing public access on our interior roads and partnering with our many lessees. It is disheartening to know that a lot of misinformation circulating Kaua'i has resulted in anxiety for those not familiar with the context surrounding current facts about the project.

Hawaii Dairy Farms' plan will benefit the island and the State in decreasing our ultimate dependence on imported foods. They have engaged in active community outreach and have voluntarily agreed to conduct an Environmental Impact Statement (EIS). While it is not required for a farming operation to go to such an extreme, it shows Hawai'i Dairy Farms' commitment to ensuring that community concerns are addressed. HDF's willingness to invest a significant amount of time and financial resources to pursue this goal of creating a sustainable milk supply should be strongly supported. Grove Farm is an avid supporter of this worthy effort.

Throughout our transition from a sugar plantation to community development and property management, Grove Farm has remained focused on building a more sustainable island community. We continue to explore opportunities in renewable energy, aquaculture, economic development and agriculture while enhancing the unique qualities that make Kaua'i our beloved island home.

If you have any questions, please contact us at 245-3678.

Sincerely,

Warren H. Haruki
President & CEO

C: Amy Hennessey, Hawaii Dairy Farms
Laura McIntyre, State of Hawaii Department of Health

3-1850 Kaumualii Highway Lihue, HI 96766-8609
P 808.245.3678 F 808.246.9470

GROUP 70
INTERNATIONAL

May 26, 2016

Warren H. Haruki
President & CEO
Grove Farm
3-1850 Kaumuali'i Highway
Līhu'e, HI 96756

Subject: Hawai'i Dairy Farms Environmental Impact Statement (EIS) Preparation Notice
Māhā'ulepū, Kōloa District, Kaua'i, Hawai'i
Response to Comments on EISPN

Dear Mr. Haruki:

Thank you for the input dated February 23, 2015 on the Hawai'i Dairy Farms Environmental Impact Statement Preparation Notice (EISPN). We acknowledge your comments about the project, and offer the following responses.

We appreciate your numerous reasons for supporting the Hawai'i Dairy Farms Project, and your history of Grove Farms activities and endeavors in the region.

HDF seeks to establish and operate a sustainable, pastoral rotational-grazing dairy farm in Māhā'ulepū Valley on the island of Kaua'i to produce fresh, locally available nutritious milk for Hawai'i families. The rotational-grazing method utilizes 100 percent of the cows' manure as fertilizer for pasture grass to provide the primary source of nutrition. This cost-effective method will reduce reliance on imported fertilizer and feed. Pasture grass will provide a local food source appropriate for cow health and quality milk production, and will initially comprise 70 percent of the animals' diet.

As you are aware, Hawai'i Dairy Farms (HDF) stepped forward in response to community concerns about the dairy for the Po'ipū area and offered to prepare a comprehensive Environmental Impact Statement (EIS) for the proposed project. It is the purpose of Hawai'i's environmental law, known as HRS Chapter 343 and "HEPA", to "*establish a system of environmental review which will ensure that environmental concerns are given appropriate consideration in decision making along with economic and technical considerations.*" The HEPA process includes scoping discussions with regulatory agencies and the community to identify issues of concern. HDF engaged technical consultants to analyze probable impacts on environmental and societal conditions. Relevant local, state and federal ordinances, statues, and regulations were considered. We believe the EIS demonstrates that this innovative dairy system will benefit the local and statewide community by advancing food sustainability.

HDF is committed to establishing a herd of up to 699 mature dairy cows, and demonstrating the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows'

Group 70 International • 925 Bethel Street, 5th Floor • Honolulu, HI 96813-4398 • tel. 808.523.5866 • fax. 808.523.5874 • www.group70int.com

health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future.

For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. The application process for a National Pollutant Discharge Elimination System (NPDES) Concentrated Animal Feeding Operation (CAFO) permit includes public notification and input. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is currently estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The proposed dairy farm will achieve the objective of increasing current local milk production and bolstering Hawai'i's declining dairy industry while reducing reliance on imported milk from the mainland United States. The rotational-grazing dairy system will utilize manure on-site as fertilizer to grow grass, reducing imported fertilizer and feed, and minimizing potential impacts to the environment. The dairy farm will comply with all applicable federal, state, and county policies in plans in regards to land use, environmental protection measures, and other associated regulatory controls.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner
cc: Hawai'i Dairy Farms
Hawai'i State Department of Health,
Environmental Planning Office

February 23, 2015

Laura McIntyre
State of Hawaii, Department of Health
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919 Ala Moana Blvd., Room 312
Honolulu, HI 96814
epo@doh.hawaii.gov

Jeff Overton
Group 70 International
925 Bethel St., 5th Floor
Honolulu, HI 96813
HDF@Group70int.com

Submitted via E-mail to all parties.

Subject: Consulted Party Comments on Preparation Notice of Draft Environmental Impact Statement (EIS) for Hawaii Dairy Farms' Proposed Dairy Operation

Dear Ms. McIntyre and Mr. Overton,

On behalf of Malama Maha`ulepu, I would like to thank you for the opportunity to comment on the Preparation Notice for the Hawaii Dairy Farms proposed dairy operation.

Maha`ulepu, Kaua`i is one of the island's natural and cultural crown jewels - the last accessible, undeveloped ahupua`a on the Southside. From Mount Ha`upu to the crashing waves of the ocean, it is a cultural landscape within which the natural and human history of millions of years is evident. Maha`ulepu is a living museum with scenic beauty, unique geology, endangered and threatened species, native Hawaiian sites and stories, agriculture and conservation lands. It is enjoyed by visitors and residents alike for hiking, fishing, limu gathering, diving, and water sports. The area is a vitally needed recreational retreat, a source of renewal and reflection, and an iconic representation of the island's rural, untouched character.

Maha`ulepu is imperative to conserve not only because it is the last undeveloped coastal area of Kaua`i's South Shore but because of the collection of resources at Maha`ulepu that express 5 million years of natural and human history.

Non-profit Malama Maha`ulepu works to protect the irreplaceable natural and cultural resources of this critical landscape and to sustain the experience of the land as an undeveloped area with compatible agriculture, education, cultural practice and recreation. We have sought to carefully balance two goals: maintaining the tradition of historic agriculture and food production and protecting the natural resources of the land and waters. In that spirit we have sought to ensure compatibility for proposed uses of the land - including this dairy.

In particular, we have strived for a transparent and understandable framework that protects this community's land, waters and people. We seek detailed assurance that the infrastructure and operating systems are in place to address basic concerns of water quality, waste management, air quality, pest and odor control, and resource protection.

As we have stated in the past, we are concerned that the dairy could negatively affect the possibility of Maha`ulepu becoming the cultural landscape and heritage place that we know it is and can be. The Draft EIS must evaluate the impacts of the project on all thresholds, including but not limited to the environmental concerns included below.

Water Quality:

Water is the key to the cultural and natural landscape and human experience of Maha`ulepu; the area's water resources must be protected from further damage by incompatible land use.

Hydrology
The potential impacts on the groundwater, streams and ocean at Maha`ulepu from the construction of dairy infrastructure and the operation of the dairy are the gravest underlying concern of the community and, certainly, of environmentalists on Kaua`i and far beyond.

Extensive hydrological study and full disclosure of the immediate and long term potential impacts of the dairy to the land and ocean waters of Maha`ulepu, surroundings and to Koloa-Poipu is critical. The public's expectations of this study are justifiably high

The hydrological study must depict the connection between the many water features of Maha`ulepu: the deep aquifer, underground flow of water, streams, springs, wetlands and the ocean. Because Maha`ulepu is largely undeveloped, the continued vitality of the water system here is evident and valuable in itself.

The risk of pollution to the ground and ocean water seems probable both from disruption by construction activities and especially from nutrient loads on and into the soils.

Agricultural infrastructure includes electrical systems, drip irrigation, drainage improvements, a potable water well, the road way from the milking barn and other structures to Maha`ulepu Road, and paths from pastures to the milking yard and barn. This construction, some of which has already occurred, may impact subsurface water flow in the valley.

Cow urine and manure and fertilizer for pasture grass cultivation, including both sprayed effluent and surface applications, are on-going operational sources of potential damage to the area's water quality. The Draft EIS must include extensive hydrological information that can show with certainty that no nutrient of effluent run off will occur.

Geography
The hydrological study or modeling should encompass the watersheds of Maha`ulepu and of adjacent Pa`a, or, at least, of coastal Pa`a. The ahupua`a understanding of watersheds as extending into the ocean should be applied because of the high water table and freshwater springs along the Maha`ulepu coast.

Both watersheds should be included in the study because the geology of Maha`ulepu and of coastal Pa`a are distinct on Kaua`i with volcanic craters displaying the layering of the Koloa volcanic series over the Waimea volcanic series, coastal limestone headlands, and caves formed in both lava and limestone. The hydrogeology of the area is not bounded by historic or modern jurisdiction. For example the Makauwahi Cave is located in both Maha`ulepu and in Pa`a.

Groundwater
The dairy is located above and withdraws potable water from the Koloa Aquifer. Since most of the drinking water for Koloa and Poipu comes from the Koloa Aquifer, the short and long term effects of the dairy's use on the area's drinking water supply must be understood.

The South Kauai Community Plan (SKCP) states that the Koloa aquifer appears more than sufficient for future needs because the aquifer's sustainable yield is 30 million gallons per day and current pumpage, without the dairy withdrawals, is estimated to be .342 MGD. The SKCP also states, "However, the State Commission on Water Resources Management (CWRM) warns that due to Kaua`i's geology it can be difficult to generate a steady supply of water by pumping from the aquifers." A hydrological study would be required for any future expansion of the water resources. (TLCG 2014)

The Draft EIS must establish the depth of the deep and shallow ground water tables throughout the valley and in THE adjacent coastal area.

The Draft EIS must address the potential for pollution of the Koloa aquifer by infiltration of nitrogen, phosphorous and potassium. The study would, therefore, model soil infiltration rates throughout the 582 acres.

Maha`ulepu Valley was a valuable water source during the sugar era. By 1898, a plantation camp in the valley existed primarily to keep the water well pumps running. The study should describe the number, location, depth and capacity and status of all historic and currently active wells within Maha`ulepu and in surrounding areas.

The water quality of Waiopili Stream is already known to be poor. Very high enterococcus counts, reported by the Surfrider Foundation, have resulted in a recent Department of Health assessment of the quality of the water and the possible sources of the pollutants in the stream. Bacterial counts in the stream are certainly important. However, the turbidity and sediment load in the stream are as important to measure and monitor because of their effects on stream biota and on condition of the estuary and the reef. The Draft EIS should address these concerns by forecasting anticipated soil run-off in the valley and requiring stringent mitigative measures in the valley and, if need be, recommending mitigative measures along the stream as it flows beyond the valley and into the ocean.

The hydrological model must include the subsurface flows and drainage. These are less likely to have been altered by sugar cultivation. Since subsurface flow could transport nutrients throughout the valley into the stream system and the ocean, subsurface flow is an important part of the hydrological system.

As an agricultural endeavor, the project's success depends upon anticipated precipitation and trans-evaporation. This water input should be included in the model, and the impact of climate change on "traditional" wind and rainfall patterns over a 100-year cycle should be factored into the Draft EIS.

The availability of water from Waita Reservoir, depended upon for irrigation, seems critical to this project. Waita draws water from the Huleia and other watersheds. The issue of ensuring sufficient in stream waters for kalo cultivation and for habitat of native species has been litigated on Oahu and Maui. On Kaua`i, community members, particularly farmers, have organized to have water returned to Eastside streams. Waita should be discussed in the Draft EIS, and particularly the possibility of not being able to take the projected volume of irrigation water from that source should be addressed. Also, other agricultural operations at Maha`ulepu and Pa`a depend upon Waita Reservoir for irrigation water. The water needs of these and future potential agricultural enterprises should be factored into discussion of the dairy's water needs.

Wetlands

Ahupua`a maps from the 19th century show a wetland area in the middle and southeastern side of the valley, below the taro lo`i. This wetland was still present, though intermittently, as recently as about a decade ago. The wetland provided seasonal waterbird habitat.

The water table is higher at the coast than in the valley, which is typical in Hawai`i. In the Makauwahi Cave Reserve fresh water is encountered at 12 feet when archaeologists and paleoecologists and others are excavating within the sinkhole area.

Today, coastal Maha`ulepu contains both natural and constructed wetlands.

There is a wetland area within the agricultural zoned land mauka of Kawailoa Bay. Kuleana owners tended salt pans in the wetland during the 19th century and into the early 20th century.

In the 1990's Grove Farm, Inc. envisioned dredging this area for a marina as part of a proposed resort residential complex.

The existence of a small historic fishpond near the Gillin House is more evidence of wetlands and the high water table.

In the nearby Old Maha`ulepu Quarry, quarrying has created numerous and extensive shallow, fresh water ponds. These are used by water birds, especially ae`o (stilt) and maoli koloa, endangered species. Waterbirds also use the recently created lo`i in the Makauwahi Cave Reserve.

Wetlands present throughout the Maha`ulepu ahupu'a'a must be fully mapped and tested during the EIS process to ensure against any degradation. Binding measures must be included to provide for regular monitoring of these sites after dairy production begins.

Springs

Waiopili Spring is a feature described by archaeologist Francis Ching as part of the cultural landscape that also included Waiopili Heiau and Kapunakea Pond. These sites were in or near the historic "Village of Maha`ulepu," some of which is located in the Makauwahi Cave Reserve. Waiopili Spring is located within the Old Maha`ulepu Quarry, and it remains a continually flowing spring.

There are also springs in the nearshore ocean along the Maha`ulepu coast and their presence may contribute to the abundance of edible seaweed along the coast.

Springs present throughout the Maha`ulepu ahupua`a must be fully mapped and tested during the EIS process to ensure against any degradation. Binding measures must be included to provide for regular monitoring of these sites after dairy production begins.

Time Frame

The model should forecast both short and long-term impacts of the dairy on the hydrological systems of Maha`ulepu and Pa`a. The potentially deleterious effects of the dairy could take years to manifest. However, substantial environmental degradation would have occurred even if the dairy were no longer in operation. If the hydrological study finds that long term or cumulative degradation of water sources and water features are at all possible, the study should recommend that HDF endow a perpetual environmental remediation and require HDF to reconsider site selection.

On-going Water Quality Monitoring

In addition to disclosing possible impacts, understanding the full hydrological systems and the potential short term, long term and cumulative impacts of the dairy on ground, subsurface stream, wetland and ocean waters of Maha`ulepu and Pa`a should result in development of a comprehensive, routine waters monitoring regime with public involvement and public disclosure.

Air Quality & Noise Concerns:

Air quality monitoring has not been included in HDF's management plans and has been an unaddressed public concern since the dairy was posited. The Project site location is upwind and less than 2 miles from residential areas and commercial operations. There must be testing done to ensure against the drifting of effluent smell into Koloa-Poipu.

The effects of noise from the dairy operation, including trucks, farm machinery, and cows, has not been addressed by HDF to this point. The EIS must determine the extent, if any, that dairy-related noise will impact the surrounding communities.

Cultural Resources:

Maha`ulepu is sacred and legendary to Native Hawaiians, many of whom are connected to this area by ancestral ties, burials in the dunes and valley, and by continuing cultural uses including fishing and gathering. There is a deep connection for many local families. Our kuleana has been restoration of the sites and of the practices that have been part of our vision

For Hawaiians, the entire area is a spiritual sanctuary. Hawaiian cultural sites deserve the utmost respect and preservation, especially if they lie within or adjacent to the proposed dairy lands. From the base of Mount Ha'upu down to the beach, unmarked sites and burial grounds dot the landscape, as Hawaiians did not label grave sites. We do not know exact locations of many of these sites. The Draft EIS must show that these sites will not be ruined by including a thorough Archeological Impact Study and a subsequent Cultural Resources Preservation Plan in order to protect these resources.

On the coast, people have talked about gathering hinahina for lei, as well as limu harvesting. But the primary cultural activity of the area is fishing. Generations of Kaua`i residents have fished along the beaches, headlands and cliffs. Throw netting as well as pole fishing and diving occur.

The EIS should examine these traditional uses, speak with local practitioners and provide sufficient assurance that the Project will not affect their continuation.

Flora and Fauna:

Waterbirds, particularly stilt and koloa duck, are migratory and depend upon having multiple habitat areas available. In recent years, water birds used an intermittent wetland in Maha`ulepu Valley as spring habitat. That area may have been altered in the past decade, but stilt and koloa duck are seen now at the recently constructed lo`i and historic fishpond area of the Makauwahi Cave Reserve as well as in shallow ponds in the Old Maha`ulepu Quarry.

The Maha`ulepu watershed has two units of habitat for endangered cave species. The Draft EIS should include possible impacts to the endemic Koloa Blind Wolf Cave spider and the blind

cave amphipod. According to Dr. David Burney, there are other cave species of significance at the Makauwahi Cave Reserve.

Furthermore, the Makauwahi Cave Reserve itself is a highly important paleo-ecological and ecological research site, where the ph of the groundwater is critical to the preservation of fossils in the sediments of the cave. Bones of more than 45 species of birds and insects have been discovered here. Most of these are extinct or rare and several are new species. Makauwahi is a model for native plant restoration which is a long term goal for Maha`ulepu.

These resources must be addressed in a full biodiversity study of all Maha`ulepu ecosystems, as part of the Draft EIS.

Alternatives:

The list of alternatives provided in Hawaii Dairy Farms EIS preparation notice is too limited. A broader set of alternatives should be suggested and thoroughly examined.

The use of alternative technologies was not mentioned as an alternative to be studied. The use of effluent ponds and to treat wastewater and manure washed from the cow yard and milking shed can be replaced with a more accurately zero discharge system of recycling waste water, capturing methane for energy production. In such systems, Sludge from waste water systems can be converted to fertilizer rather than simply spread on specified dairy fields.

Previous expenditures for the planning and the equipment (including solar panels) for the dairy should not preclude consideration of these alternatives.

Given existing environmental conditions and alarmingly high bacteria counts in Maha`ulepu streams, we expect the EIS to offer a thorough examination of the no-action alternative. Perhaps the carrying capacity of this area has already been reached, and additional intensive land uses will irreversibly contribute to the decline of environmental thresholds.

Another important alternative to study is the impacts of maintaining a smaller herd. It may be that the site cannot responsibly support the proposed 2000 cows. The amount of milk that several alternatives of smaller herds would produce has to be studied, including the longer period that the project would need to attain profitability.

Economic activity in Koloa-Poipu, indeed on Kauai, is tourism-based with Koloa-Poipu described as Kauai's Waikiki. Maha`ulepu contains the last undeveloped coast or stretch of beach.

Furthermore, the depth with which alternatives are explored will also be critical. For instance, will the alternative of moving the dairy, including locating it on land not owned by Grove Farm, Inc., be considered? Will "exchanging" land be considered, such as the tracts of land behind Hanamaulu or in the Kipu Valley? Will located the dairy on another island be considered? While

these alternatives might mean short-term monetary loses for HDF and perhaps Grove Farm, in the long term a more suitable site could be cost saving. The EIS needs to take into consideration other reasonable locations both on Kauai and elsewhere in Hawaii that meet HDF's acreage and water access requirements.

Mitigation Measures:

Because Maha'ulepu is one of the last remaining open spaces on the south shore and is beloved by both residents and visitors, it is important that binding mitigation measures are included in the EIS. An environmental remediation bond, monitoring regimes with guaranteed community involvement or even a "good neighbor agreement" are examples of mitigative measures that could be binding and should be considered as components of the Draft EIS.

The Draft EIS must adequately ensure that all mitigation will be ongoing and will meet targeted requirements. The developer must have a plan to ensure they are met, with consequences if they are not.

Additional Issues:

The EIS should include an assessment of its compliance with the South Kauai Community Plan, which guides the future growth and physical development, protecting neighborhood character, creating new economic opportunity, and enhancing the quality of life for all who live, work, visit and invest in the area.

The EIS should identify what actions will be taken to determine the timing for herd growth. We expect to see a list of environmental indicators that must be met in order for the operation to expand to its eventual size of 2,000 cows.

The EIS must include plans for site remediation for when HDF ends operations. How will HDF guarantee that Maha`ulepu will be fully restored to its current condition? The operation includes buildings, holding ponds, gates and pens, raceways, piping, fencing, and other infrastructure. Will a remediation fund be set up to cover the cost of returning the site to its natural state?

Conclusion:

Maha`ulepu is important as a collection of natural resources, history, stories - with much more to discover - daily experiences and beauty. It is all of this together that make it a heritage place, one that demands our reverence. As advocates for this special place, we hope and expect a thorough examination of waste management, air and water quality protection, herd growth triggers, cultural considerations, alternative actions, and binding mitigation measures that require community involvement.

Community participation is key to developing a comprehensive EIS and we appreciate this opportunity to share our remarks. As a consulted party to this EIS process, we look forward to providing thoughtful review and scrutiny to the Draft EIS.

With Aloha,

Greg Peters
Executive Director

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May 26, 2016

Greg Peters
Executive Director
Malama Māhāʻulepū
P.O. Box 1691
Kōloa HI 96756

Subject: Hawaiʻi Dairy Farms Environmental Impact Statement (EIS) Preparation Notice
Māhāʻulepū, Kōloa District, Kauaʻi, Hawaiʻi
Response to Comments on EISPN

Dear Mr. Peters:

Thank you for the input dated February 23, 2015 on the Hawaiʻi Dairy Farms Environmental Impact Statement Preparation Notice (EISPN). We acknowledge your comments about the project, and offer the following responses.

HDF seeks to establish and operate a sustainable, pastoral rotational-grazing dairy farm in Māhāʻulepū Valley on the island of Kauaʻi to produce fresh, locally available nutritious milk for Hawaiʻi families. The rotational-grazing method utilizes 100 percent of the cows' manure as fertilizer for pasture grass to provide the primary source of nutrition. This cost-effective method will reduce reliance on imported fertilizer and feed. Pasture grass will provide a local food source appropriate for cow health and quality milk production, and will initially comprise 70 percent of the animals' diet.

As you are aware, Hawaiʻi Dairy Farms (HDF) stepped forward in response to community concerns about the dairy for the Poʻipū area and offered to prepare a comprehensive Environmental Impact Statement (EIS) for the proposed project. It is the purpose of Hawaiʻi's environmental law, known as HRS Chapter 343 and "HEPA", to "*establish a system of environmental review which will ensure that environmental concerns are given appropriate consideration in decision making along with economic and technical considerations.*" The HEPA process includes scoping discussions with regulatory agencies and the community to identify issues of concern. HDF engaged technical consultants to analyze probable impacts on environmental and societal conditions. Relevant local, state and federal ordinances, statues, and regulations were considered. We believe the EIS demonstrates that this innovative dairy system will benefit the local and statewide community by advancing food sustainability.

HDF is committed to establishing a herd of up to 699 mature dairy cows, and demonstrating the pasture-based system as an economically and environmentally sustainable model for Hawaiʻi. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help

determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future.

For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. The application process for a National Pollutant Discharge Elimination System (NPDES) Concentrated Animal Feeding Operation (CAFO) permit includes public notification and input. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is currently estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

I. Water Quality

Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawaiʻi Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhāʻulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhāʻulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Poʻipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhāʻulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawaiʻi Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhāʻulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhāʻulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhāʻulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kauaʻi community.

Regional Water Demand: The adjacent, developed Kōloa-Poʻipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kauaʻi will increase county-wide by 17,300 residents by 2030. The

South Kauaʻi population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kauaʻi region (the Kōloa - Poʻipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhāʻulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhāʻulepū watershed.

The HDF site is located on the bottom-land of the upper Māhāʻulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Haʻupu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhāʻulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kauaʻi Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhāʻulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhāʻulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhāʻulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the

current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Poʻipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality

monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kauaʻi community.

II. Air Quality and Noise

Air Quality

As a part of the Environmental Impact Statement (EIS), existing air quality conditions and project impacts were evaluated, including dust and odor. Potential odors and emission levels for air pollutants relevant to dairy operations were modeled, as currently there are no cows on site. EIS sections 4.19 and 4.25 provide an evaluation of air quality and odors, including a windrose depicting wind speed and direction in the area (see DEIS Section 4.1, Climate). The full air quality technical report can be found in Draft EIS Appendix I.

Clean Air Act

Under the *Clean Air Act of 1970* (CAA), amended November 1990, the U.S. Environmental Protection Agency (EPA) regulates both large and small sources of air pollutants by establishing National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. The State of Hawaiʻi has established its own *State Ambient Air Quality Standards* (SAAQS) that are as strict or, in some cases more strict than the NAAQS. State standards prohibit any visible emissions of fugitive dust from construction activities at the property line.

Emissions relevant to livestock operation include particulate matter and fugitive dust. Greenhouse gases related to dairy cows include methane (CH_4) from enteric fermentation, and both methane and nitrous oxide (N_20) emissions from manure application. No State or Federal regulations for greenhouse gas emissions from farm operations or small businesses currently exist.

DUST

Dust will be generated as cows move along soft limestone walkways that connect the paddocks and lead to and from the milking parlor. Potential fugitive dust emission rates were estimated from published literature, where particulate matter (PM) is measurable from the "drylots" of confined dairy operations where animals walk over dirt and dried manure throughout the day.

Applying the emission rates from this available literature greatly overestimates potential emission resulting from HDF. Cows in the pastoral rotational-grazing system will be on pasture 22 hours each day and will spend two hours – in two separate milking cycles –moving to and from the barn for the 10- to 15-minute milking sessions.

Using atmospheric dispersion modeling system (AERMOD), the rates were scaled to the size of the non-pasture areas used by cows at HDF. Results were added to the background concentration of particulate matter (both PM_{10} and $PM_{2.5}$) measured on the island of Kauaʻi, and the total concentration was compared to the State ambient air quality standards. Only the contemplated herd size of up to 2,000 milking cows was modeled, as at the lower threshold of 699 cows, the potential fugitive dust impact would be negligible. The estimated concentration for PM_{10} is 2.01 $\mu g/m^3$, well below the State standard of 150 $\mu g/m^3$. The estimated concentration for $PM_{2.5}$ is 0.23 $\mu g/m^3$, well below the Federal standard of 35 $\mu g/m^3$ (see Draft EIS Section 4.19 and Table 4-19.2).

ODOR

Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF, so air dispersion models were used to determine potential odor levels. Local weather data was used in conjunction with the AERMOD modeling system, and published rates for manure odors emissions for dairy heifers and effluent ponds were adapted to reflect the HDF facilities.

Odor emission sources identified for modeling at HDF were manure in the pasture fields, irrigation water containing diluted nutrients from effluent, the effluent storage ponds, and the dairy buildings. Odor rates from published research were applied. Odor isopleths (a line used to map all points having the same numerical value) were created to display the model findings. Odor is described in "odor units" at the threshold of perception, which is defined by the point at which 50 percent of panelists, in laboratory conditions, cannot smell the odor but 50 percent of the panelists can detect the odor.

Modeling results were generated for worst case meteorological conditions (low wind velocity / mixing). Generally, tradewinds will disperse odors to less than detectable levels beyond the HDF site; in periods of no wind, odor may not be dispersed creating the "worst case" scenario. In these periods without normal tradewind flow, the odor plume would extend to the south of the HDF site. Sections 4.19.2 and 4.25.2 of the EIS include graphics of the potential odor isopleths.

Results for the committed herd size of 699 milking cows show that odors may be detectable by 50 percent of the sensitive population once per 200 hours, or 44 hours per year, within an area that extends approximately 1,670-feet (within one-third of a mile) beyond the dairy farm boundary, and does not reach recreational or residential areas. Results for the contemplated expanded herd size of up to 2,000 milking cows show odors would not extend beyond 2,780 feet outside the HDF boundary (just over half a mile), again not reaching recreational or residential areas, and again with detection limited to 50 percent of the sensitive population approximately 44 hours per year. The parameters used in the analysis were intentionally conservative, and the impacts shown assume an unlikely confluence of worst-case meteorological data, irrigation location, and grazing location. Actual offsite odor impacts are likely to be much lower and/or less frequent than shown; it is likely odor detection beyond the HDF boundaries will be less frequent.

GREENHOUSE GAS

Draft EIS Sections 4.19 and 4.26 address the potential for greenhouse gas emissions by Hawaiʻi Dairy Farms (HDF). Estimates of GHG emission rates from a pasture-based dairy, including methane and nitrous oxide, were calculated using the 2006 Intergovernmental Panel on Climate Change (IPCC) Guidelines for National Greenhouse Gas Inventories. Parameters for Oceanic dairy cattle in warm climates were selected as most applicable to conditions at HDF. Long-term operational impacts were modeled using the IPCC guidelines and conversions, and estimated the emissions potential for GHG at the dairy at the committed herd size of 699 milking cows to be 2,693 CO_2e metric tons per year. This equates to roughly 1.02 percent of the utility power generation sector on Kauaʻi in 2013, which does not include vehicle emissions and other GHG emitters on the island.

Potential GHG emissions for HDF at the contemplated herd size of up to 2,000 milking cows was modeled as described in Section 4.19.3 using the IPCC guidelines and conversions. The estimated total of 7,702 CO_2e metric tons per year (8,490 tons) is 5,009 CO_2e metric tons (5,521 tons) greater than the committed herd size of 699 milking cows. This equates to an increase equivalent to 1.91 percent of GHG produced on Kauaʻi for power generation by the utility in 2013 (KIUC, 2014). Power generation does not include vehicle emissions and other GHG emitters on the island.

While the presence of cows may increase GHG, a long-term beneficial impact of the grazing fields is the sequestration of carbon as CO_2 captured by the process of photosynthesis by the grass. According to recent studies in the Soil Science Society of America Journal, converting formerly tilled cropland to grazed pasture can drive substantial accumulation of organic carbons in soil, which enhances soil quality, grass production, and has the potential to offset up to one-third the annual increase in CO_2 production of an area.

Noise

Existing noise conditions of the project site and the surrounding Māhāʻulepū valley area are evaluated in the Draft Environmental Impact Statement (EIS), along with anticipated short-term and long-term noise conditions associated with the dairy farm and planned mitigation actions. Draft EIS Section 4.12 addresses noise conditions.

Noise can be defined as unwanted sound, a sound that is considered loud or unpleasant, and/or sound that causes disturbance. Research related to noise and livestock focuses on noise levels and minimization of unexpected sounds that cause undue stress on cows. Noise stress results in loss of livestock productivity and thereby financial loss to farmers and ranchers. Little research exists on the sound levels from livestock.

Sound is measured in decibels (dB). The State of Hawaiʻi Department of Health (DOH) rules use the A-weighting sound network (dBA) in the HAR §11-46, Community Noise Control. Sound through the air is similar to ripples on a pond of

water. In open space without reflection, ripples spread uniformly in all directions and decrease in amplitude further from the source. In free field conditions such as outdoors, amplitude drops by half as distance doubles (OSHA, 2016). When sound passes close to absorbing ground cover such as grassland and fields, the "soft ground" absorbs extra sound as it passes. The Hawaiʻi Dairy Farms (HDF) site in Māhāʻulepū Valley is approximately 2 miles from the resort area, and 1.5 miles from the closest residential areas (on land zoned for agriculture). Typical noise currently generated near the HDF site includes truck ingress/egress along private farm roads, agricultural equipment, and cattle and sheep.

Construction work at the project site will involve activities that may generate an increase in noise levels. However, such exposures will be a short-term condition, occurring during daylight hours. Construction vehicles and activities must comply with DOH Administrative Rules. DOH noise control regulation requires a permit for construction activities that emit noise in excess of 78 decibels or that cost a total of more than $250,000. Mitigation measures to minimize construction noise will include the use of mufflers to suppress loud equipment and limitations on the hours of heavy equipment operation.

The dairy farm will utilize milking equipment contained in the milking parlor, and will use field equipment such as tractors. Under HAR §11-46, agriculture is classified as Zoning District Class C, which specifies maximum permissible sound levels of 70 dBA in the daytime and 70 dBA at nighttime. Dairy operations will generate noise in keeping with agricultural zoning of the parcel. The primary noise receptors in the area would be farmers working nearby parcels. Noise from the dairy will not exceed the DOH threshold, and will not contribute to excessive noise in the region.

III. Cultural Resources

The Hawaiʻi Dairy Farms (HDF) project is subject to a historic preservation review by the State Department of Land and Natural Resources, State Historic Preservation Division (SHPD) under HRS Chapter 6E and Chapter 13-284. An Archaeological Inventory Survey (AIS) and a Cultural Impact Assessment (CIA) were conducted by Scientific Consultant Services (SCS) for the proposed project. EIS Sections 4.7 and 4.8 provide an evaluation of archaeology and cultural resources, with technical studies in Appendix G and H.

A total of sixteen historic properties were identified through a pedestrian survey of the project area and an extended survey area of 100 meters of the northern boundary. Six historic-era sites occur in the project area and 10 sites occur in the extended survey area. Only one of the sites is believed to be associated with pre-Contact and/or early historic times. State Site 50-30-10-2250, the agricultural heiau, and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area. The remaining sites consist of historic-era bridges, ditches, culverts, retaining walls, and a flume system dating from the 20th century and are affiliated with sugarcane cultivation.

That a majority of the documented sites are related to the historic-era is not surprising, given the massive landscape modifications that occurred during intensive sugarcane cultivation on the valley floor. Even historic era cultural materials associated with the many Land Commission Awards in the project area were non-existent, as explored through survey and subsurface exploration.

The sixteen historic properties have been assessed for significance by the archaeological consultant and the dairy project is anticipated to have no impact on these sites. No further archaeological work is recommended for the sites. Two of the sixteen sites are considered significant under multiple criteria, but occur outside the project area on lands owned by a different landowner. Both sites will not be adversely affected by the proposed dairy project. No site is related to burials, and no bonex were found. Such sites have been reported along coastal areas in sand dunes.

The cultural assessment examined the potential effect of the project on cultural resources, practices or beliefs, its potential to isolate cultural resources, practices or beliefs from their setting, and the potential of the project to introduce elements which may alter the setting in which cultural practices take place. Information received from the community indicates the Māhāʻulepū Ahupuaʻa, has been and is currently used for traditional cultural purposes. However, the dairy project area has not been included in these activities. It is clear that the gathered plants, trails, State Site 50-30-10-2250, the agricultural heiau, and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area.

The project will be fully enclosed by perimeter fencing along the boundary of the leased premises, which will ensure that project activities and any related impacts are contained within the project area. Based on the research and comments received from the community, it is reasonable to conclude that, pursuant to Act 50, the exercise of native Hawaiian rights or any ethnic group related to numerous traditional cultural practices will not be impacted by establishment of the dairy.

IV. Flora and Fauna

Waterbirds

Botanical, avian, and mammalian surveys of the property were conducted for the Draft Environmental Impact Statement (EIS) to assess existing species on site, including identifying any species listed as endangered, threatened, or proposed under any state or federal endangered species programs in or near the property. EIS Sections 4.9 and 4.10 address the evaluation of flora and fauna resources, with technical studies in Appendix A and B.

A botanical survey of the dairy property was conducted in August 2014 by AECOS Consulting to assess existing plant species. The survey also investigated for the presence of plants currently listed as endangered, threatened or proposed for listing under Federal or the State of Hawaiʻiʻs endangered species programs, located onsite or within the immediate vicinity of the dairy site. The nature of the land and its present and historical uses for intensive agriculture very much limit the natural botanical resources anticipated to occur on this land. Complete species lists are included in the EIS, and no protected botanical species occur on the project

property. The project will include vegetated buffer strips along the drainage ways as part of the Conservation Plan to reduce erosion and stabilize slopes. Where native plants occur or could survive if planted, native plants will be used in the stabilization. No long-term impacts to native plant habitats or endangered or threatened plants species will occur as a result of the dairy.

Avian and mammalian surveys were conducted in August 2014 by Rana Biological Consulting, Inc. This survey was conducted to assess the potential presence of avian or mammalian species currently listed as endangered, threatened or proposed for listing under either Federal or the State endangered species lists. The survey covered the dairy site area and immediate vicinity. Common birds and terrestrial mammals were encountered on the property. There is no critical habitat for endangered species in the upper Māhāʻulepū Valley.

Four species of endangered waterbirds were recorded on the site and at the nearby taro farm located within the HDF site. Though the area does not provide critical habitat, seabirds that nest in upland areas of Kauai may overfly the site. The endangered Hawaiian goose, nēnē was also seen on the site. State Division of Forestry and Wildlife biologists have noted nēnē are regularly seen on the subject property. It is probable that some nest on or adjacent to the site as this species nests in the general Kōloa area, and the habitat present on parts of the site is suitable for nēnē nesting.

The principal potential impacts posed to the five endangered species include those potentially associated with construction activities, and those associated with dairy farm operations following build-out. Measures will be adopted to avoid potential seabird and nēnē goose collisions with fences and structures. Potential measures include lowering construction cranes at night, using conservation fencing to project-specified areas, marking tall structures and fencing with white visibility polytape, limiting nighttime lighting, and shading any outside lights used at night. Ongoing mitigation strategies will be implemented for day-to-day preventative measures, including an Avian Species Protection Plan. Mitigation measures are further described in DEIS Section 4.10.2.

It is also likely that Hawaiian hoary bats overfly the project area on a seasonal basis. While caution will be taken during any potential disturbance or vegetation removal, there are almost no suitable roost trees within the dairy site, thus it is expected that the dairy farm will not affect this listed mammalian species.

CAVE AND LAVA TUBE INVERTEBRATES

A study of invertebrate species and pest insects was conducted by Steven Lee Montgomery, PhD, Consulting Biologist. The study summarizes the presence or absence of native species or pest species associated with cattle manure in the general Māhāʻulepū area, as well as the parasites and predators on site that control those species. Fieldwork was conducted during September 15-16, 2014. The entire study is included in Draft Environmental Impact Statement (EIS) as Appendix B.

There are no known caves or lava tubes found at or adjacent to the dairy farm property. The Kōloa Lava Tube System, which provides habitat for two endemic cave species, the Kauaʻi Cave Wolf Spider and the Kauaʻi Cave amphipod, is located several miles away from the dairy farm property. Both invertebrates are listed as endangered under the U.S. Endangered Species Act. Not all caves in the Kōloa area contain these invertebrates, as many do not contain the optimal climatological conditions required by these organisms. Neither the botanical and faunal survey nor the invertebrate survey revealed any evidence of lava tubes or caves on the property, and no such features have been reported for the area near the Hawaiʻi Dairy Farms (HDF) site. Thus no cave invertebrate species will be affected by the dairy farm.

V. Alternatives

As a part of the DEIS, alternatives were evaluated that could attain the objectives of the action's purpose and need, and were compared with environmental benefits, costs, and risks of each reasonable alternative against those of the proposed dairy project.

Four possible land uses that would not meet the project purpose were discussed. Rezoning the land for resort or residential development, or a potential conservation condemnation are two uses that were examined and eliminated from analysis. These options would not be reasonably viable given the existing private land tenure and existing zoning. Two additional alternatives were considered as reasonable land uses as they could be permitted within the existing State Land Use Agricultural District and County Agricultural Zoning District. These options include Agricultural Park with Processing Center, and development of an Agricultural Subdivision. The alternatives were examined and eliminated from further analysis, however, as they would not fulfill the project purpose. The Agricultural Park alternative does not fulfill the need for a new agricultural model, and does not provide a critical source of nutrition for the people of Hawaiʻi that is vulnerable to supply disruptive. The Agricultural Subdivision alternative does not meet the purpose and need of the proposed action, as it does not provide support for a unique underrepresented industry like dairy which is overly imported in the state of Hawaiʻi.

The analysis, therefore, focuses on alternatives that meet the project purpose. Rigorous exploration and evaluation of the environmental impacts of the alternatives, including those that might enhance environmental quality or avoid, reduce or minimize some or all of the adverse environmental effects, costs and risks. These alternatives include: (1) the development of a Conventional Feedlot Dairy (a non-pasture-based dairy) at the same location, and (2) development of the Pasture-Based Dairy at an Alternative Location on Kauaʻi. The alternative of "No Action" is also evaluated. One additional alternative was evaluated, considering a scenario for processing the dairy products at an Off-Island Facility.

Although the alternative approaches are potentially reasonable uses under existing zoning and neighboring uses, they each fail to comprehensively fulfill the requirements defined with the five established Evaluation Criteria (I-V). The essential differences as compared to the proposed action are highlighted in the following statements.

• Only one of the alternative actions (conventional feedlot alternative) would create a commercial scale dairy operation in Hawaiʻi, with the capability to produce 10 percent of the State's fresh milk demand, reducing dependence on imported milk (Criterion I). This alternative, however, would not be pasture-based and could negatively affect air and water quality.

• None of the alternatives would include a dairy location that meets the requirements of a pastoral, rotational-grazing dairy minimum land area, soil properties, slope conditions, water supply, land tenure and availability, and accessibility (Criterion 1).

• One alternative (Agricultural Park) could potentially generate new long-term employment in the agricultural sector on Kauaʻi in a wide range of positions including pasture agronomy/soils science, livestock management, environmental resources management (Criterion 2). However, the purpose and need to provide fresh fluid milk would only be met with the Conventional Feedlot Dairy Alternative.

• The alternative for Agricultural Park could also develop sustainable food production utilizing Important Agricultural Lands, demonstrating the importance of long term agricultural leases and capital investment for agricultural infrastructure, water systems and support facilities. (Criterion 3). After many years, Grove Farm encountered limited interest in such a venture.

• Finally, addressing the range of potential environmental impacts (natural, cultural, social and economic) (Criterion 5) the four alternative scenarios would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.

In contrast, the planned agricultural operations of Hawaiʻi Dairy Farm, were determined after substantial analysis to be the most viable option and is the preferred alternative. Of all the alternatives considered, this is the only approach that achieves project objectives and meets each of the five Evaluation Criteria (Section 2.3.4): Hawaiʻi Dairy Farms will create a commercial scale pasture-based dairy operation in Hawaiʻi, with the capability to provide more than 1,000,000 gallons of the fresh milk demand, reducing dependence on imported milk (Objective 1).

• The planned dairy location that meets the requirements of minimum land area, soil properties, slope conditions, water supply, land tenure and availability, and accessibility (Criterion 1).

• The planned action will generate new long-term employment in the agricultural sector on Kauaʻi, including pasture agronomy/soils science, livestock management, veterinary and animal husbandry, environmental resources management, milk/milk processing, and dairy business management (Criterion 2).

• Sustainable food production utilizing Important Agricultural Lands (Criterion 3) will occur with the proposed action, demonstrating the importance of long term agricultural leases, and the ability to draw capital investment for agricultural infrastructure including water systems and support facilities (Criterion 3).

• Address the range of potential environmental impacts by utilizing 100% of manure as natural fertilizer to grow the majority of food for cows (Criterion 4). The alternatives evaluated would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.

• Creating an economically viable pasture rotational-grazing model maintains agriculture, retains open space, and provides buffer between highly utilized resort and residential development and sensitive natural or cultural resources (Criterion 5).

VI. Additional Issues

South Kauaʻi Community Plan

The County of Kauaʻi South Kauaʻi Community Plan serves to guide development in the southern Kōloa-Poʻipū-Kalāheo-ʻOmaʻo-Lawaʻi region of Kauaʻi, and the policies are reflected in the Community Plan Land Use Map, see Draft EIS Section 5, Figure 5-14.1. Watersheds will be protected through sustainable practices in accordance with county, state, and federal guidelines, cultural resources will be identified and protected per HRS Chapter 6E Historic Preservation requirements. The agricultural use of the dairy project is consistent with the agricultural designation per the South Kauaʻi Community Plan Land Use Map, and will continue Kauaʻiʻs longstanding policy of preserving agricultural lands as a valuable resource base.

Conclusion

The proposed dairy farm will achieve the objective of increasing current local milk production and bolstering Hawaiʻiʻs declining dairy industry while reducing reliance on imported milk from the mainland United States. The rotational-grazing pasture system will utilize manure on-site as fertilizer to grow grass, reducing imported fertilizer and feed, and minimizing potential impacts to the environment. The dairy farm will comply with all applicable federal, state, and county policies in plans in regards to land use, environmental protection measures, and other associated regulatory controls.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawaiʻi Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

cc: Hawaiʻi Dairy Farms
Hawaiʻi State Department of Health,
Environmental Planning Office

Poipu Crater Homeowners' Association

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GROUP 70 INTL

February 22, 2015

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Jeff Overton
Hawai'i Dairy Farms, LLC
PO Box 1690
Koloa, HI 96756-1690

Dear Ms. McIntyre:

RE: THE ASSOCIATION OF APARTMENT OWNERS OF POIPU CRATER COMMENTS ON HAWAI'I DAIRY FARM'S ENVIRONMENTAL IMPACT STATEMENT ("EIS") PREPARATION NOTICE OF JANUARY 2015

The Association of Apartment Owners of Poipu Crater ("PC") represents a 7 acre resort development of 30 condominium units located in Poipu, Hawai'i, in close proximity to the site of the large commercial dairy being proposed by Hawai'i Dairy Farms ("HDF").

Several of our owners are full-time residents of Hawai'i, while others are from the mainland (USA & Canada) and elsewhere. Some of the owners live in areas with commercial cattle operations (feed lots and farms) and have witnessed first-hand the destructive impacts of such operations, not only on the grounds of these operations but also on the surrounding environment and any nearby communities. The impacts are a certainty; not a question of "if" but rather "to what extent" such operations affect their surroundings. Understandably, we are

deeply concerned about the impacts HDF's proposed dairy would have on Poipu, and specifically on our resort.

We therefore respectfully submit that HDF must provide factual answers in the EIS, based on science and not mere rhetoric, to our serious concerns that :

1) *The Dairy would pollute the Maha'ulepu coast.*

Note: PC owners and their guests use and tremendously enjoy the beauty of the coastline at Maha'ulepu. However, crossing Waiopili stream (by Gillin's beach) is already worrisome as the stream discharge looks awful, and we are aware of reports (by Surfrider) that it is by far the most polluted stream in Kauai, with dangerously high bacteria counts. It would defy logic that runoff from a large commercial dairy operation upstream would not further exacerbate the problem at Waiopili stream and at other discharge points along the coast.

2) *The Dairy would pose a public health risk and diminish the quality of life at our resort due to:*

a) pollution of wells feeding our drinking water supply;
b) proliferation of pests such as mosquitoes, biting flies and rats; and,
c) reduced air quality, with prevailing winds carrying noxious odours and gases to Poipu and our resort.

Note: PC owners have experienced the stench and insects when approaching existing cattle operations from miles away, especially when downwind. The smell is nauseous and needs to be washed out of clothing. We do not wish to endure this at PC; and certainly tourists would not. By what miracle will HDF's Dairy be any different than all these other cattle operations?

It is also troublesome that the HDF Dairy is apparently based on a flawed New Zealand model which has caused significant and documented environmental problems.

3) *The Dairy would have a negative economic impact by hurting Poipu's tourism industry, sinking our property values and vacation rental incomes.*

Note: If concerns 1) and 2) above are realized, then surely the economic welfare of Poipu and our resort would be severely impacted. Negative reviews and warnings on social media would repel tourism to other parts of Kauai, or to other vacation destinations altogether. Poipu would be put into economic distress.

Our concerns are legitimate and serious, and need to be directly addressed and answered by the EIS. **If facts and science do not clearly dispel these concerns, then this Diary must not be permitted.**

Regards,

John Ferrante,
President, Poipu Crater AOAO

May 26, 2016

John Ferrante
President
Po'ipū Crater AOAO
2330 Ho'ohu Road
Kōloa HI 96756

Subject: Hawai'i Dairy Farms Environmental Impact Statement (EIS) Preparation Notice
Māhā'ulepū, Kōloa District, Kaua'i, Hawai'i
Response to Comments on EISPN

Dear Mr. Ferrante:

Thank you for the input dated February 22, 2015 on the Hawai'i Dairy Farms Environmental Impact Statement Preparation Notice (EISPN). We acknowledge your comments about the project, and offer the following responses.

HDF seeks to establish and operate a sustainable, pastoral rotational-grazing dairy farm in Māhā'ulepū Valley on the island of Kaua'i to produce fresh, locally available nutritious milk for Hawai'i families. The rotational-grazing method utilizes 100 percent of the cows' manure as fertilizer for pasture grass to provide the primary source of nutrition. This cost-effective method will reduce reliance on imported fertilizer and feed. Pasture grass will provide a local food source appropriate for cow health and quality milk production, and will initially comprise 70 percent of the animals' diet.

As you are aware, Hawai'i Dairy Farms (HDF) stepped forward in response to community concerns about the dairy for the Po'ipū area and offered to prepare a comprehensive Environmental Impact Statement (EIS) for the proposed project. It is the purpose of Hawai'i's environmental law, known as HRS Chapter 343 and "HEPA", to "*establish a system of environmental review which will ensure that environmental concerns are given appropriate consideration in decision making along with economic and technical considerations.*" The HEPA process includes scoping discussions with regulatory agencies and the community to identify issues of concern. HDF engaged technical consultants to analyze probable impacts on environmental and societal conditions. Relevant local, state and federal ordinances, statues, and regulations were considered. We believe the EIS demonstrates that this innovative dairy system will benefit the local and statewide community by advancing food sustainability.

HDF is committed to establishing a herd of up to 699 mature dairy cows, and demonstrating the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help

determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future.

For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. The application process for a National Pollutant Discharge Elimination System (NPDES) Concentrated Animal Feeding Operation (CAFO) permit includes public notification and input. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is currently estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

I. Nearshore Marine Water Contamination
An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

<u>Establishment of Water Quality Monitoring:</u> Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kaua'i community.

II. Public Health Risks
<u>Groundwater</u>
Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The

location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhāʻulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhāʻulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Poʻipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhāʻulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawaiʻi Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhāʻulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture

and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhāʻulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhāʻulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kauaʻi community.

Pests

A study of invertebrate species and pest insects was conducted by Steven Lee Montgomery, PhD, Consulting Biologist in January 2016. The study summarizes the presence or absence of native species or pest species associated with cattle manure in the general Māhāʻulepū area, as well as the parasites and predators that control those species. No federally or state listed endangered or threatened invertebrate species were noted in the survey of the site. A full report and list of species found on site is provided in EIS Section 4.11 and Appendix B.

Flies were identified on the HDF site using manure from neighboring livestock as bait for invertebrates. The two flies associated with livestock are the stable fly and the horn fly, the latter known for biting cattle. These flies and the greenbottle fly are often confused with the house fly. Flies known to exist on Kauaʻi but not seen at the HDF site include the house fly, the dog dung fly, and the chicken dung fly. These pests are common in areas with high pet populations. It is possible these fly species could inadvertently be brought to the dairy and utilize manure as a food source. HDF will prevent and control fly population growth through diligent clean up and sanitation practices regarding any trash and food waste, as well as through efficient manure composting practices. A full list of site management measures is provided in EIS Section 4.11. The project location does not provide any habitat for *drosophila musaphilia*, the only Kauaʻi species of native Hawaiian fly listed as Endangered or Threatened. Native Drosophila habitat is located many miles away in the high elevation koa-ʻōhiʻa forests.

Fly populations at HDF will be minimized through a process known as Integrated Pest Management (IPM). Essentially, IPM disrupts reproduction with appropriate means at key points in the pest's life cycle. Used in Hawaiʻi for decades, a number of invertebrates and a bird (the cattle egret) were introduced between 1898 and 1950 to reduce livestock-related insects. IPM utilizes knowledge of the ancient food web among species.

An especially important insect to minimize fly breeding habitat in manure is the dung beetle, which buries manure and incorporates it into the soil. Populations of dung beetles found on Kauaʻi and those species already in Māhāʻulepū Valley, will increase with the increased manure food source, thus increasing and speeding breakdown of manure. Dung beetles are specialists in the very important natural process of breaking up and quickly recycling bovine manure pads. The behavioral diversity among dung beetle species will work together to bury dung pats in one to three days, a shorter amount of time than the 10-30 days flies eggs need to hatch.

In the Kōloa-Poʻipū region, pest fly populations are dependent upon food and breeding sources nearby such as dog, cat, and chicken feces. Beef cattle graze in the region on agricultural lands along Ala Kinoiki Road between Kōloa and Poʻipū, and it is likely the livestock-related flies identified at the HDF site occur in this region as well. Localized controls to reduce pest populations need to address breeding sites in and amongst the food and animals wastes within the area. These mitigation measures will make it difficult for flies to breed, and BMPs will be enforced to address any increase in population, therefore it is expected that the dairy farm will not significantly affect recreational and resort areas.

Air Quality – Odor

Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF, so air dispersion models were used to determine potential odor levels. Local weather data was used in conjunction with the AERMOD modeling system, and published rates for manure odors emissions for dairy heifers and effluent ponds were adapted to reflect the HDF facilities.

Odor emission sources identified for modeling at HDF were manure in the pasture fields, irrigation water containing diluted nutrients from effluent, the effluent storage ponds, and the dairy buildings. Odor rates from published research were applied. Odor isopleths (a line used to map all points having the same numerical value) were created to display the model findings. Odor is described in "odor units" at the threshold of perception, which is defined by the point at which 50 percent of panelists, in laboratory conditions, cannot smell the odor but 50 percent of the panelists can detect the odor.

Modeling results were generated for worst case meteorological conditions (low wind velocity / mixing). Generally, tradewinds will disperse odors to less than detectable levels beyond the HDF site; in periods of no wind, odor may not be dispersed creating the "worst case" scenario. In these periods without normal

tradewind flow, the odor plume would extend to the south of the HDF site. Sections 4.19.2 and 4.25.2 of the EIS include graphics of the potential odor isopleths.

Results for the committed herd size of 699 milking cows show that odors may be detectable by 50 percent of the sensitive population once per 200 hours, or 44 hours per year, within an area that extends approximately 1,670-feet (within one-third of a mile) beyond the dairy farm boundary, and does not reach recreational or residential areas. Results for the contemplated expanded herd size of up to 2,000 milking cows show odors would not extend beyond 2,780 feet outside the HDF boundary (just over half a mile), again not reaching recreational or residential areas, and again with detection limited to 50 percent of the sensitive population approximately 44 hours per year. The parameters used in the analysis were intentionally conservative, and the impacts shown assume an unlikely confluence of worst-case meteorological data, irrigation location, and grazing location. Actual offsite odor impacts are likely to be much lower and/or less frequent than shown; it is likely odor detection beyond the HDF boundaries will be less frequent.

III. Economic Impacts

The potential impacts of Hawai'i Dairy Farms (HDF) to the existing economy were evaluated in the Draft Environmental Impact Statement (EIS), including a fiscal impact assessment report completed in April, 2016 by Plasch Economics Pacific. Draft EIS Section 4.15 addresses demographic and economic factors, with the complete report in Appendix J.

The HDF project would create short-term benefits through jobs for local construction personnel and local material suppliers. Such jobs would include equipment operators, cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, supervisors, painters, etc. Based on State employment multipliers, indirect employment related to Dairy construction would be expected to average about 16 jobs on Kauaʻi, and 8 on Oʻahu. Construction employment would be expected to average about 12 jobs per year during the development period. Thus direct-plus-indirect employment association with construction would be expected to average approximately 36 jobs, of which 28 would be on Kauaʻi.

The HDF project would contribute to diversification of Kauaʻi's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Hawaiʻi Island), approximately10 percent of Hawaiʻi's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and indirect full-time equivalent jobs on Kauaʻi, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on Oʻahu.

HDF is expected to generate a net income of approximately $68,000 to the County when the 699 cow herd is established. When the dairy has matured to full production for the 699 cow dairy, net income to the State is calculated at $160,000 annually. With the potential contemplated herd size of up to 2,000 mature dairy cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be produced. This would double local milk production currently supplied by operational dairies on the Island of Hawaiʻi.

Additional employment generated by a possible expansion to accommodate the contemplated 2,000 mature dairy cow herd is estimated at approximately 3 construction jobs plus 4 indirect jobs on Kauaʻi, and 2 indirect jobs on Oʻahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an additional 5 full-time farm jobs would be added, with approximately 15 additional indirect jobs on Kauaʻi and another 8 indirect jobs on Oʻahu.

The dairy is expected to generate a net additional contribution to the County of approximately $8,000 for improvements related to expansion for the contemplated herd size of up to 2,000 mature dairy cows ($76,000 total versus $68,000 for the committed herd size). The State will derive approximately $360,000 annually in revenues from the contemplated 2,000-mature dairy cow dairy.

Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

Conclusion
The proposed dairy farm will achieve the objective of increasing current local milk production and bolstering Hawaiʻiʻs declining dairy industry while reducing reliance on imported milk from the mainland United States. The rotational-grazing dairy system will utilize manure on-site as fertilizer to grow grass, reducing imported fertilizer and feed, and minimizing potential impacts to the environment. The dairy farm will comply with all applicable federal, state, and county policies in plans in regards to land use, environmental protection measures, and other associated regulatory controls.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawaiʻi Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

cc: Hawaiʻi Dairy Farms
Hawaiʻi State Department of Health,
Environmental Planning Office

From: Greg Peters
To: epo@doh.hawaii.gov; HDF
Subject: Dairy EIS prep notice public comment for Sierra Club
Date: Monday, February 23, 2015 6:44:10 PM
Attachments: SC_kauaigroup_dairyEIS_comments.pdf

Good Evening Ms. McIntyre and Mr. Overton,

Please accept the attached document, provided in pdf format, as the Sierra Club's public comment for the HDF EIS Preparation Notice.

Mahalo,

Greg Peters

--
Greg Peters
on behalf of the Kaua`i Group Executive Committee

Hawaii Chapter of the Sierra Club
Kauai Group
PO Box 3412
Lihue, Hawaii
96766

SIERRA CLUB OF HAWAI'I
KAUA'I GROUP

MALAMA I KA HONUA
Cherish the Earth

February 23, 2015

Laura McIntyre
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Jeff Overton
Group 70 International
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Submitted via E-mail to all parties.

RE: **Notice of Preparation of Draft Environmental Impact Statement (EIS) for Hawaii Dairy Farms' Proposed Dairy, Maha`ulepu, Kauai**

Aloha Ms. McIntyre and Mr. Overton,

The Kaua`i Group of the Sierra Club of Hawai`i appreciate the opportunity to comment on the EIS Preparation Notice for Hawaii Dairy Farms' proposed dairy operation.

As part of America's oldest, largest and most influential grassroots environmental organization, the Sierra Club Hawaii Chapter has a kuleana to provide scrutiny to any proposed land uses that could pose harm to the island's natural resources. In our review of the proposal we have found causes of grave concern that the placement of a dairy in the culturally and environmentally sensitive Maha`ulepu Valley will have disasterous effects on Kauai's environment.

With more than 150,000 pounds of manure being produced every month with multiple county water wells in close proximity, there are serious health hazards and environmental risks threatening Maha'ulepu's beautiful, ecologically unique, and culturally significant coastline. The multiple iterations of HDF's operations and waste management plans have provided neither sound planning nor wise resource utilization and were based on incorrect information and untested assumptions.

<u>Water Quality Protection</u>

- We expect an extensive hydrological study to be completed for the entire Maha`ulepu watershed to establish ground and surface water flows. The study must describe in detail how cow effluent will not contaminate water resources while remaining entirely on site.
- Explain in more detail the drainage improvements, which may include drain lines, grass swales, and culverts to balance any expected increases in runoff resulting from the proposed project.
- Describe in detail how the discovery of any nonpoint source pollution of valley water will be managed.

- Please describe in detail any specific mitigation measures to address erosion and flash flood hazards in the Maha`ulepu Valley.
- Please describe in detail potential impacts to the community's drinking water from effluent run off and the response plan for addressing public health dangers.
- Potential indirect and cumulative impacts of the dairy on ground, subsurface stream, wetland and ocean waters of Maha`ulepu should result in development of a comprehensive, routine waters monitoring regime with public involvement and public disclosure.

Herd Management
Identify what actions will be taken to determine the timing for herd growth. We expect to see a list of environmental indicators that must be met in order for the operation to expand.

Air Quality and Noise Concerns
Air quality monitoring has not been included in HDF's management plans and has been an unaddressed public concern since the dairy was posited. The Project site location is upwind and less than 2 miles from residential areas and commercial operations. There must be testing done to ensure against the drifting of effluent smell into Poipu-Koloa.

Cultural Concerns
The Draft EIS must show that the many unmarked cultural sites in Maha`ulepu Valley will not be ruined by including a thorough Archeological Impact Study. The EIS should examine traditional Hawaiian uses of the land and provide sufficient assurance that the Project will not affect their continuation.

Alternative Actions
A thorough set of alternative actions must be examined, that include alternative site selection both on-island and off-island, smaller herd sizes, and no-action.

Mitigation Measures
Meaningful mitigation measures must be included in the EIS in order to provide greater transparency in the operation and provide the community with assurance that any environmental damage can be addressed immediately. Examples include mandated community involvement in environmental monitoring, the issuance of an environmental remediation bond, or joint fact finding in the event of potential damage.

We believe that a thorough and impartial EIS process is the only means to provide reasonable certainty that the project will not negatively impact Maha'ulepu's land, waters, and neighboring communities. Thank you for your consideration of our comments. We look forward to being a consulted party for review of the Draft EIS.

Aloha,

Greg Peters
on behalf of the Kaua`i Group Executive Committee

Hawaii Chapter of the Sierra Club
Kauai Group
PO Box 3412
Lihue, Hawaii
96766

May 26, 2016

Greg Peters
on behalf of
The Kaua'i Group Executive Committee
Hawai'i Chapter of the Sierra Club
Kaua'i Group
P.O. Box 3412
Līhu'e, HI 96766

Subject: Hawai'i Dairy Farms Environmental Impact Statement (EIS) Preparation Notice
Māhā'ulepū, Kōloa District, Kaua'i, Hawai'i
Response to Comments on EISPN

Dear Mr. Peters:

Thank you for the input dated February 23, 2015 on the Hawai'i Dairy Farms Environmental Impact Statement Preparation Notice (EISPN). We acknowledge your comments about the project, and offer the following responses.

HDF seeks to establish and operate a sustainable, pastoral rotational-grazing dairy farm in Māhā'ulepū Valley on the island of Kaua'i to produce fresh, locally available nutritious milk for Hawai'i families. The rotational-grazing method utilizes 100 percent of the cows' manure as fertilizer for pasture grass to provide the primary source of nutrition. This cost-effective method will reduce reliance on imported fertilizer and feed. Pasture grass will provide a local food source appropriate for cow health and quality milk production, and will initially comprise 70 percent of the animals' diet.

As you are aware, Hawai'i Dairy Farms (HDF) stepped forward in response to community concerns about the dairy for the Po'ipū area and offered to prepare a comprehensive Environmental Impact Statement (EIS) for the proposed project. It is the purpose of Hawai'i's environmental law, known as HRS Chapter 343 and "HEPA", to "*establish a system of environmental review which will ensure that environmental concerns are given appropriate consideration in decision making along with economic and technical considerations.*" The HEPA process includes scoping discussions with regulatory agencies and the community to identify issues of concern. HDF engaged technical consultants to analyze probable impacts on environmental and societal conditions. Relevant local, state and federal ordinances, statues, and regulations were considered. We believe the EIS demonstrates that this innovative dairy system will benefit the local and statewide community by advancing food sustainability.

HDF is committed to establishing a herd of up to 699 mature dairy cows, and demonstrating the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure

environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future.

For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. The application process for a National Pollutant Discharge Elimination System (NPDES) Concentrated Animal Feeding Operation (CAFO) permit includes public notification and input. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is currently estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

Water Quality Protection
Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhā'ulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhā'ulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Po'ipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhā'ulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawai'i Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhā'ulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhā'ulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhā'ulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kaua'i community.

Regional Water Demand: The adjacent, developed Kōloa-Po'ipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kaua'i will increase county-wide by 17,300 residents by 2030. The

South Kaua'i population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kaua'i region (the Kōloa - Po'ipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhā'ulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhā'ulepū watershed.

The HDF site is located on the bottom-land of the upper Māhā'ulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Ha'upu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhā'ulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kaua'i Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhā'ulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhā'ulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhā'ulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the

current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhā'ulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Po'ipū region were also calculated. Nitrogen input to the marine environment in the Po'ipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Po'ipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality

monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kaua'i community.

Herd Management

The milk production cycle of a cow begins after birth of a calf, when lactation begins. Newborn calves will be housed on the Māhā'ulepū site and provided essential colostrum and nutrients for a healthy start. During the calves' initial 90 days, they will be transitioned to pasture at HDF before transfer to ranches on Kaua'i to be raised offsite. The permitted herd size of 699 mature dairy cows at the Māhā'ulepū site applies to mature dairy cows. Animals in various stages of lactation and rest will be transferred between HDF and other ranches as needed for animal health and dairy productivity. This will both benefit the dairy, and infuse the beef market in Hawai'i with a new, local source of pasture-raised calves. Male calves will become part of the beef cattle herd; heifers (female calves that haven't given birth) will be raised until returned to the HDF herd as a birthing/milking cow.

Two ranches on Kaua'i have initially expressed an interest in taking HDF calves and cows. Makoa Ranch near Kapa'a is an active cattle ranch run by the Farias family. The ranch will care for dry cows during an annual resting period, and raise calves until ready for return to HDF pasture. Calves suitable as beef cattle will be incorporated into the Makoa Ranch herd or sold to other ranching operations. "Close-up cows", or those cows returning to milk production at HDF will initially be transferred to 'Oma'o Ranch for transition.

Annually, dairy cows are rested or "dried" for 60 days before returning to milk production. The existing ranch operations are established and require no additional facilities, permits, or improvements to have fluctuation in herd numbers, which is typical of cattle operations.

Air Quality

As a part of the Environmental Impact Statement (EIS), existing air quality conditions and project impacts were evaluated, including dust and odor. Potential odors and emission levels for air pollutants relevant to dairy operations were modeled, as currently there are no cows on site. EIS sections 4.19 and 4.25 provide an evaluation of air quality and odors, including a windrose depicting wind speed and direction in the area (see DEIS Section 4.1, Climate). The full air quality technical report can be found in Draft EIS Appendix I.

ODOR

Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF, so air dispersion models were used to determine potential odor levels. Local weather data was used in conjunction with the AERMOD modeling

system, and published rates for manure odors emissions for dairy heifers and effluent ponds were adapted to reflect the HDF facilities.

Odor emission sources identified for modeling at HDF were manure in the pasture fields, irrigation water containing diluted nutrients from effluent, the effluent storage ponds, and the dairy buildings. Odor rates from published research were applied. Odor isopleths (a line used to map all points having the same numerical value) were created to display the model findings. Odor is described in "odor units" at the threshold of perception, which is defined by the point at which 50 percent of panelists, in laboratory conditions, cannot smell the odor but 50 percent of the panelists can detect the odor.

Modeling results were generated for worst case meteorological conditions (low wind velocity / mixing). Generally, tradewinds will disperse odors to less than detectable levels beyond the HDF site; in periods of no wind, odor may not be dispersed creating the "worst case" scenario. In these periods without normal tradewind flow, the odor plume would extend to the south of the HDF site. Sections 4.19.2 and 4.25.2 of the EIS include graphics of the potential odor isopleths.

Results for the committed herd size of 699 milking cows show that odors may be detectable by 50 percent of the sensitive population once per 200 hours, or 44 hours per year, within an area that extends approximately 1,670-feet (within one-third of a mile) beyond the dairy farm boundary, and does not reach recreational or residential areas. Results for the contemplated expanded herd size of up to 2,000 milking cows show odors would not extend beyond 2,780 feet outside the HDF boundary (just over half a mile), again not reaching recreational or residential areas, and again with detection limited to 50 percent of the sensitive population approximately 44 hours per year. The parameters used in the analysis were intentionally conservative, and the impacts shown assume an unlikely confluence of worst-case meteorological data, irrigation location, and grazing location. Actual offsite odor impacts are likely to be much lower and/or less frequent than shown; it is likely odor detection beyond the HDF boundaries will be less frequent.

Noise

Existing noise conditions of the project site and the surrounding Māhā'ulepū valley area are evaluated in the Draft Environmental Impact Statement (EIS), along with anticipated short-term and long-term noise conditions associated with the dairy farm and planned mitigation actions. Draft EIS Section 4.12 addresses noise conditions.

Noise can be defined as unwanted sound, a sound that is considered loud or unpleasant, and/or sound that causes disturbance. Research related to noise and livestock focuses on noise levels and minimization of unexpected sounds that cause undue stress on cows. Noise stress results in loss of livestock productivity and thereby financial loss to farmers and ranchers. Little research exists on the sound levels from livestock.

Sound is measured in decibels (dB). The State of Hawai'i Department of Health (DOH) rules use the A-weighting sound network (dBA) in the HAR §11-46, Community Noise Control. Sound through the air is similar to ripples on a pond of water. In open space without reflection, ripples spread uniformly in all directions and decrease in amplitude further from the source. In free field conditions such as outdoors, amplitude drops by half as distance doubles (OSHA, 2016). When sound passes close to absorbing ground cover such as grassland and fields, the "soft ground" absorbs extra sound as it passes. The Hawai'i Dairy Farms (HDF) site in Māhā'ulepū Valley is approximately 2 miles from the resort area, and 1.5 miles from the closest residential areas (on land zoned for agriculture). Typical noise currently generated near the HDF site includes truck ingress/egress along private farm roads, agricultural equipment, and cattle and sheep.

Construction work at the project site will involve activities that may generate an increase in noise levels. However, such exposures will be a short-term condition, occurring during daylight hours. Construction vehicles and activities must comply with DOH Administrative Rules. DOH noise control regulation requires a permit for construction activities that emit noise in excess of 78 decibels or that cost a total of more than $250,000. Mitigation measures to minimize construction noise will include the use of mufflers to suppress loud equipment and limitations on the hours of heavy equipment operation.

The dairy farm will utilize milking equipment contained in the milking parlor, and will use field equipment such as tractors. Under HAR §11-46, agriculture is classified as Zoning District Class C, which specifies maximum permissible sound levels of 70 dBA in the daytime and 70 dBA at nighttime. Dairy operations will generate noise in keeping with agricultural zoning of the parcel. The primary noise receptors in the area would be farmers working nearby parcels. Noise from the dairy will not exceed the DOH threshold, and will not contribute to excessive noise in the region.

Cultural Concerns

The Hawai'i Dairy Farms (HDF) project is subject to a historic preservation review by the State Department of Land and Natural Resources, State Historic Preservation Division (SHPD) under HRS Chapter 6E and Chapter 13-284. An Archaeological Inventory Survey (AIS) and a Cultural Impact Assessment (CIA) were conducted by Scientific Consultant Services (SCS) for the proposed project. EIS Sections 4.7 and 4.8 provide an evaluation of archaeology and cultural resources, with technical studies in Appendix G and H.

A total of sixteen historic properties were identified through a pedestrian survey of the project area and an extended survey area of 100 meters of the northern boundary. Six historic-era sites occur in the project area and 10 sites occur in the extended survey area. Only one of the sites is believed to be associated with pre-Contact and/or early historic times. State Site 50-30-10-2250, the agricultural heiau, and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area. The remaining sites consist of historic-era bridges, ditches, culverts,

retaining walls, and a flume system dating from the 20th century and are affiliated with sugarcane cultivation.

That a majority of the documented sites are related to the historic-era is not surprising, given the massive landscape modifications that occurred during intensive sugarcane cultivation on the valley floor. Even historic era cultural materials associated with the many Land Commission Awards in the project area were non-existent, as explored through survey and subsurface exploration.

The sixteen historic properties have been assessed for significance by the archaeological consultant and the dairy project is anticipated to have no impact on these sites. No further archaeological work is recommended for the sites. Two of the sixteen sites are considered significant under multiple criteria, but occur outside the project area on lands owned by a different landowner. Both sites will not be adversely affected by the proposed dairy project. No site is related to burials, and no bonex were found. Such sites have been reported along coastal areas in sand dunes.

The cultural assessment examined the potential effect of the project on cultural resources, practices or beliefs, its potential to isolate cultural resources, practices or beliefs from their setting, and the potential of the project to introduce elements which may alter the setting in which cultural practices take place. Information received from the community indicates the Māhā'ulepū Ahupua'a, has been and is currently used for traditional cultural purposes. However, the dairy project area has not been included in these activities. It is clear that the gathered plants, trails, State Site 50-30-10-2250, the agricultural heiau, and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area.

The project will be fully enclosed by perimeter fencing along the boundary of the leased premises, which will ensure that project activities and any related impacts are contained within the project area. Based on the research and comments received from the community, it is reasonable to conclude that, pursuant to Act 50, the exercise of native Hawaiian rights or any ethnic group related to numerous traditional cultural practices will not be impacted by establishment of the dairy.

Alternative Actions

As a part of the DEIS, alternatives were evaluated that could attain the objectives of the action's purpose and need, and were compared with environmental benefits, costs, and risks of each reasonable alternative against those of the proposed dairy project. Further discussion of alternatives can be found in DEIS Section 6.

The DEIS evaluates alternatives that could attain the objectives of the action's purpose and need, and compares environmental benefits, costs, and risks of each reasonable alternative against those of the proposed action. Additionally, reasonable land use alternatives that emerged from public input during the project scoping phase are documented and briefly discussed. The alternatives that do not meet the project purpose are not advanced for analysis of environmental benefits, costs, and risks. The Environmental Impact Statement Rules, Hawai'i Administrative Rules Chapter 11-200 (HRS 11-200) requires a discussion of alternatives that could

attain the objectives of the action, regardless of cost. There is no requirement for the alternatives analysis to consider every possible land use.

Four possible land uses that would not meet the project purpose are discussed. Rezoning the land for resort or residential development, or a potential conservation condemnation are two uses that were examined and eliminated from analysis. These options would not be reasonably viable given the existing private land tenure and existing zoning. Two additional alternatives were considered as reasonable land uses as they could be permitted within the existing State Land Use Agricultural District and County Agricultural Zoning District. These options include Agricultural Park with Processing Center, and development of an Agricultural Subdivision. The alternatives were examined and eliminated from further analysis, however, as they would not fulfill the project purpose.

The analysis, therefore, focuses on alternatives that meet the project purpose. Rigorous exploration and evaluation of the environmental impacts of the alternatives, including those that might enhance environmental quality or avoid, reduce or minimize some or all of the adverse environmental effects, costs and risks. These alternatives include: (1) the development of a Conventional Feedlot Dairy (a non-pasture-based dairy) at the same location; (2) development of the Pasture-Based Dairy at an Alternative Location on Kaua'i; and (3) milk products processing by HDF. The alternative of "No Action" is also evaluated.

The alternatives analysis provides a comprehensive evaluation of the range of potential alternatives, including the two alternative development scenarios. Although the alternatives are potentially reasonable uses under existing zoning and neighboring uses, each fails to comprehensively fulfill the project requirements defined by the eight Project Objectives and the four established Evaluation Criteria (Chapter 2, Sections 2.3.3 and 2.3.4).

The essential differences as compared to the proposed action are highlighted in the following statements.

- Only one of the alternative actions (conventional feedlot alternative) would create a commercial scale dairy operation in Hawai'i, with the capability to produce 10 percent of the State's fresh milk demand thus reducing dependence on imported milk (Objective 1). This alternative, however, would not reduce reliance on costly imported fertilizer and feed (Objective 2); grow local, quality grass as a primary feedstock (Objective 3); and would not utilize 100 percent of manure on site as nutrients to grow forage for dairy cows (Criterion 4).
- None of the alternatives would secure a dairy location that meets the requirements for a pastoral, pasture-based grazing dairy: sufficient contiguous land area; available long-term land tenure; adequate potable water supply; suitable soil properties; gentle slope conditions; and accessibility (Criterion 1).
- One alternative (Agricultural Park) could potentially generate new long-term employment in the agricultural sector on Kaua'i in a wide range of positions

  including pasture agronomy/soils science, environmental resources management (Criterion 2).
- The Agricultural Park alternative could also develop sustainable food production utilizing Important Agricultural Lands, demonstrating the importance of long-term agricultural leases and capital investment for agricultural infrastructure, water systems and support facilities. (Criterion 3). However, after years of trying, it appears there was limited interest in such a venture.
- Finally, addressing the range of potential environmental impacts (natural, cultural, social and economic) (Objective 8) the two alternative development scenarios would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.

In contrast to the other options considered, the planned agricultural operation of Hawai'i Dairy Farms, was determined to be the most viable option and is the preferred alternative. Of all the alternatives considered, this is the only approach that achieves project objectives and meets each of the four Evaluation Criteria.

- Hawai'i Dairy Farms will create a commercial scale pasture-based dairy operation in Hawai'i, with the capability to provide more than 1,000,000 gallons of the fresh milk demand, reducing dependence on imported milk (Objective 1).
- The planned dairy location meets the requirements of minimum land area, soil properties, slope conditions, water supply, land tenure and availability, and accessibility (Criterion 1).
- The planned action will generate new long-term employment in the agricultural sector on Kaua'i, including pasture agronomy/soils science, veterinary and animal husbandry, environmental resources management, milk/milk processing, and dairy business management (Criterion 2).
- Sustainable food production utilizing Important Agricultural Lands (Criterion 3) will occur with the proposed action, demonstrating the importance of long term agricultural leases, and the ability to draw capital investment for agricultural infrastructure including water systems and support facilities (Criterion 3).
- Address the range of potential environmental impacts by utilizing 100 percent of manure as natural fertilizer to grow the majority of food for cows (Criterion 4). The alternatives evaluated would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.
- Creating an economically viable pasture rotational-grazing model maintains agriculture, retains open space, and provides buffer between highly utilized resort and residential development and sensitive natural or cultural resources (Objective 8).

Conclusion

The proposed dairy farm will achieve the objective of increasing current local milk production and bolstering Hawai'i's declining dairy industry while reducing reliance on imported milk from the mainland United States. The rotational-grazing dairy system will utilize manure on-site as fertilizer to grow grass, reducing imported fertilizer and feed, and minimizing potential impacts to the environment. The dairy farm will comply with all applicable federal, state, and county policies in plans in regards to land use, environmental protection measures, and other associated regulatory controls.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

cc: Hawai'i Dairy Farms
Hawai'i State Department of Health,
Environmental Planning Office

SURFRIDER FOUNDATION
KAUAI CHAPTER

February 20, 2015

RECEIVED
FEB 23 2015
GROUP 70 INTL

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Jeff Overton, Principal Planner

Comments to be considered in preparation of an Environmental Impact statement for:
Project Name: Hawai'i Dairy Farms
Island: Kaua'i
District: Poipu
TMK: (4) 2-9-003:001 (portion); 006 (portion)
(4) 2-9-001:001 (portion)

Dear Sirs:

After carefully reviewing the plan for the Hawaii Dairy Farm (HDF) provided to the public for comments to be considered in drafting the Environmental Impact Statement, the Kauai Chapter of The Surfrider Foundation (Surfrider) asserts that the HDF has already had serious environmental impacts due to its agricultural activities in preparing the farm for the arrival of cows and that upon arrival of the cows the impacts would be significant and severe.

Surfrider's mission and focus is on the coastal zone. As a result it addresses a number of issues related to ocean and coastal use and development, such as water pollution, beach access, coastal development and nearshore ocean protection. Its mission is "the protection and enjoyment of the world's oceans, waves and beaches". There is no question that agricultural and animal feed lots are a major source of ocean pollution. Both the Pew Ocean Commissions report entitled "America's Living Oceans: Charting a Course for Sea Change" and the US

Commission on Ocean Policy report entitled, "An Ocean Blueprint for the 21st Century" identify agricultural and livestock facilities as major contributors to water quality impairment. These reports, among others, can be found here: http://jointoceancommission.org/rc2reports.html

Surfrider's Blue Water Task Force has been monitoring the concentrations of fecal indicator Enterococcus bacteria in Waiopili Stream, which receives water from the drainage ditches of HDF and empties in to the ocean at Mahaulepu near what is locally known as Gillin's Beach. In addition, Surfrider has been measuring nutrient concentrations (Total Nitrogen, Ammonium Nitrogen, Nitrate + Nitrite, Phosphorous), total suspended solids, and turbidity in those stream waters. These data were provided to the Hawaii Department of Health (DOH) and the DOH collected and analysed its own additional samples. The geometric mean values for the results of analysis of samples collected by Surfrider between March 7, 2014 and February 7, 2015 far exceed Hawaii State Standards and qualify the stream and the receiving beach waters as polluted (Table 1).

Table 1.

Surfrider Foundation - Kauai Chapter			
Waiopili Stream	units	Geometric mean	# of Samples
Total Nitrogen	mg/L	0.500	4
Nitrate + Nitrite Nitrogen	mg/L	0.103	4
Ammonia Nitrogen	mg/L	0.100	4
Total Phosphorus	mg/L	0.064	4
Total Suspended Solids	mg/L	38.5	6
Turbidity	NTU	39.5	16
Enterococcus	#/ 100 ml	8572.9	20
Gillin's Beach			
Enterococcus	#/ 100 ml	637	18
Turbidity	NTU	5.1	12

Surfrider has expressed to the DOH that an NPDES permit is required of HDF as the stream and ocean are already chronically polluted. HDF apparently applied and then withdrew its application for a NPDES permit while continuing activities on its property that added to the pollution.

HDF needs to correct the water quality impairments that exist from current on-site activities before the State even considers allowing a large-scale project to proceed. Once the site has been remediated and pollution sources addressed, then HDF will need to prove through the EIS study that additional activities will not add any further significant environmental impacts.

Of specific concern are the following criteria for the EIS preparation notice:

Criteria #2. Curtails the range of beneficial uses of the environment (for plants, animals, or humans).

Stream, estuarine, and coastal waters polluted with pathogens curtails the recreational use of those waters by humans and their pets by increasing the probability of getting infected while in the waters. The presence of pathogens also curtails traditional cultural practices, subsistence fishing, and subsistence gathering of seaweed in the Mahaulepu area, as ingestion of the food could also cause infections. Surfrider and DOH data indicate extremely high concentrations of fecal indicating bacteria (Enterococcus and Clostridium) in Waiopili stream and coastal waters at Mahaulepu. This is against the federal Clean Water Act and Hawaii Revised Statues. Whether these bacteria originate from humans or animals is irrelevant, as pathogens are associated with animal fecal material. The documented presence of fecal indicating bacteria before the large herd of HDF cows are even on the land, points out the inevitability of fecal contamination by runoff from the HDF. The HDF claim of "zero discharge" has already been shown to be false. Compact clay soil, huge amounts of manure and urine, and rainfall will undoubtedly cause runoff in to HDF ditches which are designed to discharge into Waiopili stream and thus the ocean. Pathogens in the water seriously curtails the range of beneficial uses of Mahaulepu for humans and animals.

Criteria #5. Substantially affects public health.

The documented presence of fecal indicating bacteria and the DNA analysis of Bacteroidales, proves there is a public health risk in waters of Waiopili stream and the ocean where it enters. These indicators were found in the ditch drainage system of HDF even before cows were brought on to the property and feral and domestic animal concentrations were low. With 2000 cows there contaminating the soils with their feces and urine, runoff into the Waiopili stream is inevitable. People and their pets that are in the public recreational waters of Waiopili stream and the ocean are at high risk of infection. There is one documented case of such infection. HDF must prove that there will never be discharge from direct surface runoff or ditch discharge into Waiopili stream. The waters are already polluted under standards set in Hawaii Administrative Rules Chapter11-54 and must not be polluted further.

Perhaps of greater importance is the potential for contamination of Kauai County public drinking water wells and a private drinking water well near the HDF. Contamination of these wells by pathogens, nitrates, and phosphates is likely as the cows' urine and manure is deposited directly on the fields and waste water collected in basins is sprayed on the fields. There are also concerns about the possible contamination of the well water by hormones and antibiotics that are in the feed or are given directly to the cows. HDF must prove that their waste management system will not cause any contamination of shallow or deep drinking water wells.

Criteria #7. Involves a substantial degradation of environmental quality.

The data provided in Table 1 above, along with the data from DOH, proves that the HDF and adjacent agricultural and industrial activities have polluted state waters above Hawaii State Criteria for fecal indicating bacteria, nutrients, turbidity and total suspended solids. The ocean at Gillin's beach is polluted for fecal indicating bacteria coming from stream waters. The waters are already polluted and under state law, must not be polluted further. HDF must prove that there will never be discharge from direct surface runoff or ditch discharge into Waiopili stream.

Surfrider tests of shallow groundwater in the Gillin's Beach area shows that it too is polluted with nutrients. Through submarine groundwater discharge this contaminated water pollutes nearshore waters. With the addition of 2000 cows to HDF, percolation of nutrients (mainly nitrogen and phosphorous compounds) into the shallow groundwater and migration into

nearshore waters is inevitable. This is predicated to cause nutrification of these waters and ecological changes to the algal and coral communities.

Application of pesticides for weed control may contaminate water and mud in Waiopili stream and thus affect environmental quality. Preliminary tests of the stream suggest that glyphosate may already be present at very low concentrations. More thorough baseline testing is planned by HDF and the results may express further concerns for environmental quality of stream and nearshore waters that must be addressed in the EIS.

Antibiotics used in animal feed and through direct injection of cows are of great environmental concern, both as how they affect stream and nearshore ecosystem ecology and how they might foster the evolution of antibiotic resistant strains of pathogenic bacteria. These would enter the environment where cows were contaminating the soils with their feces and urine and this then entered either surface waters by runoff or groundwater by percolation. The impounding of animal wastes and then spraying them on to the fields might further the contamination of the environment.

Hormones used in dairy operations are also of environmental concern as they might alter normal reproductive physiology of stream and marine organisms, thus changing the basic ecology of the stream, estuarine and nearshore ocean ecosystems.

HDF must prove that there will never be discharge of pollutants from direct surface runoff or ditch discharge into Waiopili stream, and that percolation into both shallow and deep groundwater will not contaminate stream, estuarine and coastal waters.

Criteria #8. Is individually limited but cumulatively has considerable effect upon the environment or involves a commitment for larger actions.

HDF leases and manages the largest tract of land in lower Mahaulepu valley, but there are other agricultural leases producing taro, corn, cattle and other crops in the same drainage basin. In addition, there is an industrial quarry operation in the area. Collectively and cumulatively they have significantly impacted the water quality of the area as expressed in the water quality of Waiopili stream, the shallow groundwater near the beach, and the ocean. Of obvious concern with agricultural operations is the application of additional amounts of nutrients, whether from animal wastes or commercial fertilizer, and increased soil runoff. Unique to the HDF operations will be the addition of antibiotics and hormones into the environment. HDF needs to address how the addition of 2000 cows will increase the already polluting cumulative impact of the leased area on its waters.

Criteria #10. Detrimentally affects water quality.

The data provided in Table 1 above, along with the data from DOH, proves that the HDF and adjacent agricultural and industrial activities have polluted state waters above Hawaii State Criteria for fecal indicating bacteria, nutrients, turbidity and total suspended solids. The ocean at Gillin's beach is polluted for fecal indicating bacteria coming from stream waters. The waters are already polluted and under state law, must not be polluted further. HDF must prove that there will never be discharge from direct surface runoff or ditch discharge into Waiopili stream.

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Hormones used in dairy operations are also of environmental concern as they might alter normal reproductive physiology of stream and marine organisms, thus changing the basic ecology of the stream, estuarine and coastal ocean ecosystems.

HDF must prove that there will never be discharge of pollutants from direct surface runoff or ditch discharge into Waiopili stream, and that percolation into both shallow and deep groundwater will not contaminate drinking, stream, estuarine and nearshore coastal waters.

Criteria #11. Affects or is likely to suffer damage by being located in an environmentally sensitive area such as a flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, fresh water or coastal waters

HDF is located at the upper elevations of a gently sloping coastal watershed, bounded by ridges and drained by agricultural ditches and Waiopili stream. While long in agriculture, the lower reach of the watershed comprise environmentally sensitive wetlands, streams, estuaries, beaches and coastal waters. Improper land use practices associated with dairy farming have the potential to cause sediment and nutrients to move from the fields by surface runoff and groundwater discharge into this beautiful and undeveloped landscape. These wetlands support native Hawaiian waterfowl species that are protected under the endangered species act. HDF must prove that its operations will not damage the environmentally sensitive coastal ecosystems at Mahaulepu.

Alternatives:

The HDF as proposed would be an environmental disaster. In addition to No Action and New Location alternatives, HDF must consider one more alternative, that of greatly reducing the ultimate size of the herd from approximately 2000 cows to a more reasonable, from a waste management perspective, 600 cows or less. The coastal environment cannot afford an overloading of nutrients, pathogens, antibiotics and hormones. HDF cannot just keep increasing herd size until the water and the air is polluted. There is no way to clean it up after the fact. Monitoring programs are only useful if a complete shutdown of operations is legally mandated if State pollution levels are reached. Those levels have already been reached in Mahaulepu.

Respectfully submitted,

Carl J. Berg, Ph.D.
Kauai Chapter
The Surfrider Foundation
P. O. Box 819
Waimea, HI 96796

GROUP 70
INTERNATIONAL

May 26, 2016

Carl J. Berg, Ph.D.
The Surfrider Foundation
Kaua'i Chapter
P.O. Box 819
Waimea, HI 96796

Subject: Hawai'i Dairy Farms Environmental Impact Statement (EIS) Preparation Notice
Māhā'ulepū, Kōloa District, Kaua'i, Hawai'i
Response to Comments on EISPN

Dear Dr. Berg:

Thank you for the input dated February 20, 2015 on the Hawaiÿi Dairy Farms Environmental Impact Statement Preparation Notice (EISPN). We acknowledge your comments about the project, and offer the following responses.

HDF seeks to establish and operate a sustainable, pastoral rotational-grazing dairy farm in Māhā'ulepū Valley on the island of Kaua'i to produce fresh, locally available nutritious milk for Hawai'i families. The rotational-grazing method utilizes 100 percent of the cows' manure as fertilizer for pasture grass to provide the primary source of nutrition. This cost-effective method will reduce reliance on imported fertilizer and feed. Pasture grass will provide a local food source appropriate for cow health and quality milk production, and will initially comprise 70 percent of the animals' diet.

As you are aware, Hawai'i Dairy Farms (HDF) stepped forward in response to community concerns about the dairy for the Po'ipū area and offered to prepare a comprehensive Environmental Impact Statement (EIS) for the proposed project. It is the purpose of Hawai'i's environmental law, known as HRS Chapter 343 and "HEPA", to "*establish a system of environmental review which will ensure that environmental concerns are given appropriate consideration in decision making along with economic and technical considerations.*" The HEPA process includes scoping discussions with regulatory agencies and the community to identify issues of concern. HDF engaged technical consultants to analyze probable impacts on environmental and societal conditions. Relevant local, state and federal ordinances, statues, and regulations were considered. We believe the EIS demonstrates that this innovative dairy system will benefit the local and statewide community by advancing food sustainability.

HDF is committed to establishing a herd of up to 699 mature dairy cows, and demonstrating the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help

determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future.

For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. The application process for a National Pollutant Discharge Elimination System (NPDES) Concentrated Animal Feeding Operation (CAFO) permit includes public notification and input. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is currently estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

I. Stream Contamination

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhā'ulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhā'ulepū watershed.

The HDF site is located on the bottom-land of the upper Māhā'ulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Ha'upu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhā'ulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kaua'i Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhā'ulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhā'ulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhā'ulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

II. Ground Water and Hydrology

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhā'ulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhā'ulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Po'ipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhā'ulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawai'i Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhā'ulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhā'ulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhā'ulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kaua'i community.

Regional Water Demand: The adjacent, developed Kōloa-Po'ipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kaua'i will increase county-wide by 17,300 residents by 2030. The South Kaua'i population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kaua'i region (the Kōloa - Po'ipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

III. Endangered Species

Botanical, avian, and mammalian surveys of the property were conducted for the Draft Environmental Impact Statement (EIS) to assess existing species on site, including identifying any species listed as endangered, threatened, or proposed under any state or federal endangered species programs in or near the property. EIS Sections 4.9 and 4.10 address the evaluation of flora and fauna resources, with technical studies in Appendix A and B.

A botanical survey of the dairy property was conducted in August 2014 by AECOS Consulting to assess existing plant species. The survey also investigated for the presence of plants currently listed as endangered, threatened or proposed for listing under Federal or the State of Hawai'i's endangered species programs, located onsite or within the immediate vicinity of the dairy site. The nature of the land and its present and historical uses for intensive agriculture very much limit the natural

botanical resources anticipated to occur on this land. Complete species lists are included in the EIS, and no protected botanical species occur on the project property. The project will include vegetated buffer strips along the drainage ways as part of the Conservation Plan to reduce erosion and stabilize slopes. Where native plants occur or could survive if planted, native plants will be used in the stabilization. No long-term impacts to native plant habitats or endangered or threatened plants species will occur as a result of the dairy.

Avian and mammalian surveys were conducted in August 2014 by Rana Biological Consulting, Inc. This survey was conducted to assess the potential presence of avian or mammalian species currently listed as endangered, threatened or proposed for listing under either Federal or the State endangered species lists. The survey covered the dairy site area and immediate vicinity. Common birds and terrestrial mammals were encountered on the property. There is no critical habitat for endangered species in the upper Māhā'ulepū Valley.

Four species of endangered waterbirds were recorded on the site and at the nearby taro farm located within the HDF site. Though the area does not provide critical habitat, seabirds that nest in upland areas of Kauai may overfly the site. The endangered Hawaiian goose, nēnē was also seen on the site. State Division of Forestry and Wildlife biologists have noted nēnē are regularly seen on the subject property. It is probable that some nest on or adjacent to the site as this species nests in the general Kōloa area, and the habitat present on parts of the site is suitable for nēnē nesting.

The principal potential impacts posed to the five endangered species include those potentially associated with construction activities, and those associated with dairy farm operations following build-out. Measures will be adopted to avoid potential seabird and nēnē goose collisions with fences and structures. Potential measures include lowering construction cranes at night, using conservation fencing to project-specified areas, marking tall structures and fencing with white visibility polytape, limiting nighttime lighting, and shading any outside lights used at night. Ongoing mitigation strategies will be implemented for day-to-day preventative measures, including an Avian Species Protection Plan. Mitigation measures are further described in DEIS Section 4.10.2.

It is also likely that Hawaiian hoary bats overfly the project area on a seasonal basis. While caution will be taken during any potential disturbance or vegetation removal, there are almost no suitable roost trees within the dairy site, thus it is expected that the dairy farm will not affect this listed mammalian species.

Conclusion
The proposed dairy farm will achieve the objective of increasing current local milk production and bolstering Hawai'i's declining dairy industry while reducing reliance on imported milk from the mainland United States. The rotational-grazing dairy system will utilize manure on-site as fertilizer to grow grass, reducing imported fertilizer and feed, and minimizing potential impacts to the environment. The dairy farm will comply with all applicable federal, state, and county policies in plans in regards to land use, environmental protection measures, and other associated regulatory controls.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

cc: Hawai'i Dairy Farms
Hawai'i State Department of Health,
Environmental Planning Office

From:	Larsen-Dias, Cynthia R.
To:	HDF
Subject:	2-23-15 Kawailoa Development Comments on Hawaii Dairy Farms EISPN.PDF
Date:	Monday, February 23, 2015 2:50:11 PM
Attachments:	5188906_1_2-23-15 Kawailoa Development Comments on Hawaii Dairy Farms EISPN.PDF

Hard copy via U.S. mail.

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February 23, 2015

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Re: Comments on Hawai'i Dairy Farms' Environmental Impact Statement Preparation Notice

To Whom It May Concern:

This letter is sent on behalf of Kawailoa Development LLP ("Kawailoa Development") to provide comments on the Environmental Impact Statement Preparation Notice ("EISPN"), published in the Environmental Notice on January 23, 2015, for the dairy farm ("Dairy") proposed by Hawai'i Dairy Farms ("HDF") in Māhā'ulepū, Kaua'i.

Kawailoa Development is the owner of the Grand Hyatt Kaua'i and the Poipu Bay Golf Course. Kawailoa Development has a substantial interest in the Environmental Impact Statement ("EIS") process, pursuant to Hawai'i Revised Statutes ("HRS") chapter 343, as both the Grand Hyatt Kaua'i and the Poipu Bay Golf Course will be directly affected by the operations of the Dairy. The project boundary of the Dairy will be less than a mile from the boundary of the Poipu Bay Golf Course and a mere mile and a half from the boundary of the Grand Hyatt Kaua'i. Kawailoa Development therefore requests that it be a consulted party pursuant to Hawai'i Administrative Rules ("HAR") § 11-200-15.

I. OVERVIEW

This project is of significant public interest. Not only will the project affect the over 1,000 employees at the Grand Hyatt Kaua'i and Poipu Bay Golf Course, but adverse consequences resulting from the Dairy's operations will be a concern for all who visit, live or work in the Po'ipū and Koloa area. The full-scale operations of the Dairy have already been acknowledged by Hawai'i Dairy Farms to be a Concentrated Animal Feeding Operation ("CAFO"), and at 2,000 cows, or even 699 cows (HDF's purported first phase), the Dairy will be one of the largest and most concentrated in the State. As the U.S. Environmental Protection Agency ("EPA") has stated, "The concentrations of waste from these animals increase the potential to impact air, water, and land quality." Given such potential impacts, a careful and deliberate review of the environmental impacts is imperative before permits are granted.

Kawailoa Development offers its comments in two categories: comments on the EIS process and comments on the scope of impact evaluation.

II. COMMENTS ON THE EIS PROCESS

A. An After-The-Fact EIS Violates Chapter 343

For the reasons set forth in its Second Amended Complaint, filed *ex officio* on December 9, 2014 in Civil No. 14-1-0141 JRV, pending before the Circuit Court of the Fifth Circuit, Kawailoa Development disagrees with HDF's statement that "[n]one of the agricultural operations associated with the [Dairy] constitute a 'trigger' under HRS Chapter 343 requirements." EISPN at 4-2. In brief, HDF has proposed to construct and operate a wastewater treatment unit and is therefore required to study the impacts of its wastewater treatment unit and its Dairy as required by HRS Chapter 343. HDF's statement that the EIS is "being prepared voluntarily," EISPN at 1-1, is flatly incorrect. HDF's failure to disclose in the EISPN that the Dairy will have a wastewater treatment unit constitutes a withholding of vital information.

On the cover page of the EISPN, HDF states that the document was "prepared pursuant to Hawai'i Revised Statutes, Chapter 343, Environmental Impact Statement Law and Chapter 200 of Title 11, Administrative Rules, Department of Health, Environmental Impact Statement Rules." *See also* EISPN at 4-2 (the EISPN was prepared "pursuant to HRS Chapter 343 and HAR Chapter 200."). According to the EISPN, however, HDF purports to have already received the following permits and approvals:

- County of Kaua'i - Building Permit (November 2014)
- County of Kaua'i - Grading and Grubbing Agricultural Exemption (March 2014)
- State of Hawai'i Department of Health Wastewater Branch - Animal Feeding Operation/Waste Management Plan (October 2014)

- U.S. Department of Agriculture Natural Resources Conservation Service – Agricultural Conservation Plan (no date provided)

EISPN at 2-4. The EISPN fails to disclose that HDF also received approval from the Department Wastewater Branch for its Individual Wastewater System on April 23, 2014. *See* Exhibit A. Additionally, there are applications for permits and approvals currently pending before the Department and other State agencies, including the National Pollutant Discharge Elimination System ("NPDES") Construction Stormwater General Permit and Historic Preservation Review.

It is well-settled that the purpose of Chapter 343 is informed decision making. HRS § 343-1 ("It is the purpose of this chapter to establish a system of environmental review which will ensure that environmental concerns are given appropriate consideration in decision making along with economic and technical considerations."). Hence, the Hawai'i EIS Law requires that, "the agency initially receiving and agreeing to process the request for approval shall require the applicant to prepare an environmental assessment of the proposed action at the earliest practicable time." The EIS rules mandate that,

> An EIS is meaningless without the conscientious application of the EIS process as a whole, and shall not be merely a self-serving recitation of benefits and a rationalization of the proposed action. Agencies shall ensure that statements are prepared <u>at the earliest opportunity in the planning and decision-making process</u>. This shall assure an early open forum for discussion of adverse effects and available alternatives, and that the decision-makers will be enlightened to any environmental consequences of the proposed action.

HAR § 11-200-14 (emphasis added). HDF's EIS process will result in the very "meaningless" EIS contemplated by the rules. Where permits have already been issued, the EIS will be the contemplated "self-serving recitation of benefits and a rationalization of the proposed action."

The Hawai'i Supreme Court has long held that an EIS must precede any state or county approvals. *See, e.g.*, *Molokai Homesteaders Coop. Ass'n.*, 63 Haw. 453, 467-68, 629 P.2d 1134, 1144 (1981) (noting that an EIS is a "prerequisite" for Board approval of a request); *Sierra Club v. Office of Planning*, 109 Hawai'i 411, 416-17, 126 P.3d 1098, 1103-04 (2006) (holding a land reclassification petition as the earliest practicable time at which to prepare the environmental assessment). Further,

> <u>[D]ecisions reflecting environmental considerations can most easily be made when other basic decisions are also being made, that is, during the early stages of project conceptualization and planning</u>. . . . [E]arly environmental assessment comports with the purpose of HEPA to alert decision-makers early in the

> development process because, "after major investment of both time and money, it is likely that more environmental harm will be tolerated."

Sierra Club, 109 Hawai'i at 419, 126 P.3d at 1106 (citations omitted) (emphasis in original). Since the EIS informs the decision-making process, it is an abuse of the EIS process for HDF to propose an EIS that rationalizes approvals that have already been issued. Environmental review after decisions have already been made is "a *post hoc* rationalization to support action already taken." *Citizens for the Protection of the North Kohala Coastline v. County of Hawai'i*, 91 Hawai'i 94, 105, 979 P.2d 1120, 1131 (1999).

Here, HDF proposes an after-the-fact EIS that violates Chapter 343. Although HDF has stated that it prepared the EISPN and will prepare the appropriate environmental documents in accordance with HRS chapter 343, it already sought and received apparent approvals for portions of its proposed action without first satisfying the mandates of Chapter 343. Moreover, based on such approvals, HDF has already conducted site work that is part of and necessary to the construction of its Dairy. By placing the cart before the horse, the EIS process is turned on its head. Environmental assessments and environmental impact statements are the bases for future decisions, permits and approvals. The EIS does not presume such decisions, permits and approvals. If conducted only after the decisions have been predetermined, however, a mockery will have been made of the EIS process.

In sum, this EISPN and any EIS prepared in accordance with it do not comply with the procedures mandated by Chapter 343 and its implementing rules. Without waiving its right to challenge the process proposed by HDF which violates Chapter 343, Kawailoa Development provides further comments below.

B. Alternatives Must Be Considered

Hawai'i Administrative Rules ("HAR") § 11-200-17(f) sets forth a list of categories of alternatives to be considered and directs that "[p]articular attention shall be given to alternatives that might enhance environmental quality or avoid, reduce, or minimize some or all of the adverse environmental effects, costs, and risks." HDF must carefully consider at least two additional alternatives in its Draft EIS.

First, the alternative locations that the EISPN proposes to consider as required by HAR § 11-200-17(f)(5) are arbitrarily limited to the island of Kaua'i. EISPN at 2-3. There is nothing in HAR § 11-200-17(f)(5) that limits "alternative locations" to those on the same island as the proposed project. It is appropriate and important that the EIS consider alternative locations on all islands. Given the size of the Dairy either at initial or at full-scale operations, milk production and distribution will not be limited only to Kaua'i. Kaua'i has no milk processing facilities. Among other things, HDF must consider the environmental impacts incident to transportation of its milk products in its EIS and compare those to statewide locations that are larger and/or better suited than Māhā'ulepū valley and where inter-island transportation for milk processing may not be required.

Second, the Draft EIS must consider "[t]he alternative of postponing action pending further study[.]" HAR § 11-200-17(f)(4). In-depth studies of environmental and cultural issues, and particularly impacts to groundwater and surface water, must be undertaken before the dairy can be constructed. As will be discussed below, the Dairy at full-scale operation poses serious, irreversible risks to Māhā'ulepū and it is crucial that in-depth research is conducted prior to the Dairy's operations.

C. Discharges from the Dairy Must be Identified and Evaluated

HDF's EISPN makes the cavalier and conclusory statement that its Dairy will be "zero-discharge." EISPN at 1-2, 2-2, 3-4. While this might be a marketing slogan or a hoped-for result, the extent and nature of the discharges to be generated by the Dairy should be the result of careful and scientific study conducted via the EIS process. Whether there might not be any point-source discharge is subject to serious debate, but the fact of the matter is that there will be discharge. As indicated by the Dairy's own statement in Section 4.0, "Potential for increased air and water emissions will be evaluated in the Draft EIS." HDF's assumption that its Dairy is zero-discharge misleads the public and foretells a dangerously breezy Draft EIS. If HDF assumes no discharges (presumably because it says so), then there will be no impacts to evaluate in a Draft EIS. Such an assumption relating to the nature and extent of discharges (whether nutrients, organic matter and/or bacteria) is at the heart of this matter. An in-depth consideration of the environmental ramifications of Dairy operations, and their related discharges is required.

HDF's claim of zero-discharge, whether defined as in the EISPN as zero discharge with respect to nutrients in the manure, or by any other means, EISPN at 2-2, is contradicted in the EISPN itself. A detailed root zone soil water balance, for example, would not have been required to show available water holding capacity throughout the year with the proposed rainfall, irrigation, manure loading, wastewater loading, and off-site storm water that will overflow onto the fields.

Moreover, the Draft EIS should describe how many of the 2,000 cows are milking and dry, or just milking. The description of the associated ancillary stock should also include how many cows are dry, replacement heifers, bulls, or pre-weaned calves. The location of each cow should be described, as well as the plans for their shelter during inclement weather. The location also affects the amount of nutrients in the pasture. The Draft EIS should describe the paddock rotation schedule. The long transit times may translate to more manure deposited on cow runs, where no plants are growing, as opposed to the pasture.

Even assuming there is no point source discharge from this facility, there will be obvious storm water discharge. Grazing cattle will deposit feces and urine as they graze, and these fecal parts are prone to intense rainfall events. Nutrients, organic matter, and bacteria will be discharged through storm water from the paddocks to waterbodies. The potential for storm water to carry nutrients and manure from the feedlot areas and pastures to the ditches draining the property and ultimately to the coast must be carefully and thoroughly evaluated. The Draft EIS should also discuss its drainage plans and whether depressions in the field will be drained with buried perforated pipe or surface drains to reduce ponding and vector breeding.

III. TECHNICAL SCOPING COMMENTS

Technical, scientific comments are provided by Kawailoa Development with the assistance of two experts: Dr. Deanne Meyer and Mr. Mark Madison in sections III.A., B. and C., below. Dr. Meyer is a Research Scientist and Cooperative Extension Specialist in the Department of Animal Science at the University of California, Davis (UC Davis). Mr. Madison is an agricultural, environmental and civil engineer, and senior project manager with CH2M HILL, a global engineering and consulting firm.

A. Groundwater

Section 3.1.3 of the EISPN provides that the Māhāʻulepū well site contains up to 14 irrigation wells drilled by former sugar plantations and "[d]rinking water and irrigation water supply for HDF, and ground water quality will be addressed in the Draft EIS." The EISPN fails to acknowledge that the Dairy will impact groundwater. The environmental impacts on groundwater cannot be ignored in the Draft EIS.

The environmental impact of potential wellhead inundation with wastewater must be quantified. Wellhead analysis is crucial to prevent pollution migration to groundwater. Therefore, existing wellhead installation reports need to be analyzed to ensure no environmental impacts will occur from manure storage or application events. The analysis should include the potential lateral movement of manure or feed nutrients through soil to wellheads.

In addition, the non-uniform application of urine and feces by grazing dairy cattle can lead to groundwater contamination. The environmental impact of the cattle mob's grazing activities on groundwater, surface water and air emissions must therefore be quantified. Furthermore, proper wellhead installation practices for new wells must be identified and followed to protect the wells from inundation of manure effluent.

The environmental impact of the over-application of liquids from the storage pond at times when storage capacity is insufficient—such as in times of rain—must be quantified. This is especially critical during wet periods; the Draft EIS must address the increased groundwater contamination potential from irrigating well-drained soils during wet periods.

The animal cemetery also needs to be analyzed, particularly because the cemetery appears to be located in soil with a 6-12% slope. Digging the defined trenches for mortality may be challenging in sloping soils and erosion control will be essential. Runoff will need to be diverted so that the cemetery will not be inundated and the decomposing animals will not leach into the groundwater. Animal disposal issues in a catastrophic event may exceed the assimilative capacity of the soil at the animal cemetery to treat and remove nutrients and fluids of decomposing cattle. Additionally, it is apparent that a riverine is located next to the paddock with the cemetery. Management of the riverine is important to ensure that it does not flow onto the cemetery. The Draft EIS should assess if positive drainage will exist to minimize the

ponding of rain water and to prevent deep percolation near feed or waste storage locations and the animal cemetery.

Because the nitrogen cycle is inefficient, with losses occurring from application to plant uptake, it is critical that the Draft EIS examine the nutrient balance in the watershed. Because the desired rates of growth for the kikuyu grass will require importing high quantities of fertilizer, the environmental impact for this must be quantified. Nutrient application rates should be compared to site specific conditions that may differ from values in the NRCS 590 Nutrient Management standard. Environmental monitoring of the groundwater wells is critical to ensure safety of the groundwater supply. Moreover, monitoring is important to ensure that volatilized ammonia will not damage surface water or plant productivity once deposited back to the water or ground. Examination of the nutrient balance should consider: (1) nutrient loads from milking cows, dry cows, and calves; (2) actual net removal of nutrients in a grazing system, as net removal is generally very low in grazed systems (cattle are voiding wastes as they are eating); (3) ammonia volatilization and denitrification; (4) total waste production (urine and manure); and (5) nitrogen carryover from one year to the next from incomplete mineralization of organic nitrogen. The impact on groundwater will accumulate over time and should be presented in a long term nutrient plan accounting for all forms of nitrogen.

The phosphorus index is an index value that identifies if there are sufficient or insufficient amounts of phosphorus in the soil. It is important to have a feedback mechanism to evaluate if the targets of the Dairy are achieved and if they are not, what modifications need to occur and what potential environmental ramifications may occur as a result. The phosphorus index value calculations should therefore be reviewed to determine when soil storage capacity for phosphorus will be exceeded. The impact of elevated phosphorus in groundwater and coastal freshwater should be presented and a timeline for phosphorus breakthrough should be projected.

B. Surface Water

Section 3.1.3 of the EISPN fails to disclose that two defined and regulated State Waters traverse the Dairy property, improperly characterizing them as "ditches." According to the Hawaiʻi Clean Water Branch Water Quality Map, two streams run through the middle of Māhāʻulepū valley and discharge into the ocean. State water quality data designates the two streams in Māhāʻulepū valley as Class 2.

> The objective of class 2 waters is to protect their use for recreational purposes, the support and propagation of aquatic life, agricultural and industrial water supplies, shipping, and navigation. The uses to be protected in this class of waters are all uses compatible with the protection and propagation of fish, shellfish,

> and wildlife, and with recreation in and on these waters. These waters shall not act as receiving waters for any discharge which has not received the best degree of treatment or control compatible with the criteria established for this class. No new treated sewage discharges shall be permitted within estuaries.

HAR § 11-54-3(b)(2) (emphasis added). The two streams in Māhāʻulepū valley converge and are classified as Class 1 as the waterbody approaches the Māhāʻulepū coast and discharges into the ocean.

> It is the objective of class 1 waters that these waters remain in their natural state as nearly as possible with an absolute minimum of pollution from any human-caused source. To the extent possible, the wilderness character of these areas shall be protected. Waste discharge into these waters is prohibited, except as provided in section 11-54-4(e). Any conduct which results in a demonstrable increase in levels of point or nonpoint source contamination in class 1 waters is prohibited.

HAR § 11-54-3(b)(1) (emphasis added). The waterbody discharges into the ocean, which is classified as Class A.

> It is the objective of class A waters that their use for recreational purposes and aesthetic enjoyment be protected. Any other use shall be permitted as long as it is compatible with the protection and propagation of fish, shellfish, and wildlife, and with recreation in and on these waters. These waters shall not act as receiving waters for any discharge which has not received the best degree of treatment or control compatible with the criteria established for this class.

HAR § 11-54-3(c)(2) (emphasis added).

The Draft EIS must properly characterize the two state waters flowing through the middle of the Dairy and evaluate impacts to the stated goals for these waters and the adjacent marine waters

In addition, HDF fails to identify wetlands in and adjacent to the dairy property. According to the U.S. Fish and Wildlife Service's National Wetlands Inventory map, there are four bodies of water within the upper half of the Dairy's property boundary. Additionally, there is a wetland just south of the Dairy's property boundary. The identification of wetlands is important as they feed downstream waters, trap floodwaters, recharge groundwater supplies and provide fish and wildlife habitat. In the Draft EIS, HDF must, with input and approval from the U.S. Army Corps of Engineers, delineate the boundary of wetlands within its property. The

Draft EIS must evaluate Dairy impacts on these regulated wetlands. The Draft EIS must also evaluate whether activities impacting wetlands are subject to regulation under Swampbuster provisions of the Food Security Act of 1985 that discourages the conversion of wetlands to cropland use.

Given the presence of surface waters throughout the Dairy, it is important to protect riparian areas during construction as well as operation. The Draft EIS should address whether cattle will be fenced out of the riparian areas or whether water flow will be altered to avoid the areas with cattle. Depending on the type of fencing used, construction could generate erosion resulting in sedimentation in riparian areas and surface waters.

The Dairy is located at the bottom of a steep watershed with a creek flowing through the center of the manure application fields. Additionally, the perimeter of the property has greater slopes, which is problematic because runoff will likely be greater from these areas and will be directed through the paddocks. Therefore, the potential for flash floods to flow over the farm may be high. A detailed hydrologic analysis and storm water flow projection should be conducted and compared to the capacity of the stream channel to project field flooding and flushing. The Draft EIS should determine whether concrete or roofed surfaces increase runoff to surface waters during severe storm events, and whether intense rainfall events will result in pond inundation or runoff of manure from pastures.

Surface water exiting the property should be monitored during storm events before land is disturbed, during construction, and after the Dairy is operational. Monitoring activities should include an analysis of pH, temperature, turbidity, fecal coliform, and BOD5. Analysis of downstream sedimentation will be important, particularly because subsequent runoff from roads and manure may impact sedimentation. That is, the Draft EIS should analyze the amount of sediment (depth), the dimension of the active water paths (streams, creeks), and whether there are flora or fauna in downstream surface waters that may be harmed by sedimentation and runoff.

The impact of storm water runoff on surface water during construction must be analyzed. Construction activities could result in the degradation of receiving water, especially during storm events. The construction of buildings, fences and roads, and the installation of irrigation systems must be evaluated with respect to soil conservation and prevention of erosion. Storm water discharge should be sampled to ensure that environmental impact is not occurring; this would include the first water running off during a storm event as well as sampling during large rainfall events (1" or more in 24 hours).

The Draft EIS should also study how the Dairy's operational activities will affect surface water. The environmental impact of runoff from areas of intensive use (including the area where cows enter the milking parlor, gate openings, cattle water troughs, cow walkways, and roads) must be identified. The Draft EIS should assess if mud will accumulate (and potentially be carried in storm water runoff) in these intensively used areas.

Any potential failure of the retention pond storage structure and its environmental impact must be identified. If pond failure results in over-application of effluent to fields, impacts to groundwater must be identified and analyzed.

The water balance and irrigation schedule must be examined in detail, including soil water holding capacity by soil type, hydraulic loading from irrigation, precipitation, and evapotranspiration (ET). Evapotranspiration estimates should be based on Penman-Monteith calculations of crop ET from reference crop ET. The southwest corner of the farm contains shallow soils over bedrock that will need to be managed. This area will be drip irrigated with fresh water, but nutrient loading will come from periodic application of settling pond solids.

Finally, irrigation system failure or wind drift of irrigation with effluent must be accounted for, and the potential impact on surface water must be determined so that appropriate setback distances may be identified. The Draft EIS must examine the potential for malfunction of the GPS system and for unintended, accidental irrigation of effluent directly on the creek, drainage ditches and raceways. The Draft EIS must also describe and evaluate whether the irrigation system will adequately correct for wind speeds and directions during irrigation.

C. Air Quality

The EISPN broadly states that air quality conditions and agricultural odor conditions will be evaluated in the Draft EIS. EISPN at 3-3. However, the discussion of air quality in the EISPN is oversimplified. First, construction related activities may generate dust emissions, including PM10 and PM2.5, as well as exhaust emissions. Second, the Dairy's operations may generate exhaust emissions from daily operational activities. PM emissions may be generated from project operational activities, including vehicular traffic on unpaved roads and access roads, animal movement on unpaved surfaces, and equipment operation. Third, project operations may also generate ammonia and hydrogen sulfide emissions. Ammonia deposition in surface waters or plants should be evaluated.

Additionally, the Draft EIS should analyze the animal facilities as a source of flies, mosquitoes and odor. The following odor and gas emission sources should be considered: milking parlor, effluent lagoons, manure directly deposited on pasture by cows, effluent irrigation, and periodic solids application from the lagoons. The Draft EIS should analyze the potential for periodic sludge applications from the settling pond via "gun" application to produce odors, and identify options for reducing the odor potential. The Draft EIS should also address the need for monitoring and for adaptive management to control odor issues (such as sludge application methods and adequate aeration of the effluent pond to control odors). Drag sock (LEPA) technology on the center pivots should be included in the evaluation as a potential means of providing both efficient irrigation (uniform application) while at the same time greatly reducing the potential for odors.

Greenhouse gas emissions from the cows, decomposing manure, decomposing buried dead animals and Dairy operations should be quantified.

The Draft EIS must also assess air impacts from transportation of the Dairy's unprocessed milk to a neighbor island for processing. It is unclear whether the Dairy has committed to returning all processed milk to Kaua'i for sale. If the intent is to return processed milk to Kaua'i for sale, then air quality impacts from this additional transportation must also be included in the analysis of air quality impacts in the Draft EIS.

D. Socio-Economic Conditions

The EISPN states that "a projection of the HDF's anticipated economic impact will be included in the Draft EIS," in the context of a paragraph regarding the amount of milk needed to sustain 70,000 people on the island of Kaua'i. EISPN at 3-3. This paragraph insinuates that the economic impact that will be studied involves the economics of providing locally-produced milk, processed on Oahu, to a Kaua'i population. An economic impact analysis should not be so limited. In particular, the EISPN must evaluate the negative economic impact on businesses and property owners in the Po'ipū area caused by odor, vectors, air impacts and water impacts from the Dairy.

The businesses in the surrounding area, including the Grand Hyatt Kaua'i and the Poipu Bay Golf Course, will be directly affected by odor and flies from Dairy operations. The Grand Hyatt Kaua'i employs more than 1,000 residents of Kaua'i, and hosted many guests, conventions and functions in 2014. The economic impacts of odors and flies, which will not be welcomed by surrounding businesses and their guests and customers must be studied in detail in the Draft EIS so that decisionmakers issuing approvals can evaluate the economic impact of the Dairy on the Kaua'i community.

Finally, "HDF will grow Kikuyu and Kikuyu-Guinea grass throughout the pastures." EISPN at 2-2. These grasses have been considered to be invasive. The economic impact of these invasive grasses on surrounding land areas must be identified and evaluated.

E. Soils and Topography

Although Section 3.1.3 states that no changes in topography will occur, HDF's Waste Management Plan ("Waste Mgt. Plan") states otherwise. According to the Waste Mgt. Plan dated July 23, 2014, "[a] secondary berm will be constructed downhill of the effluent ponds at the edge of the paddock before the existing drainageway and farm road." Waste Mgt. Plan at 49. Additionally, the Waste Mgt. Plan describes a raceway which will act as a berm to separate the paddocks from any water ways. *Id.* at 40. Further, HDF's plans to install a drip irrigation line, *id.* at 30, are also an indication that soil will be disturbed if the line will be underground.

The extensive poorly drained, clay soils at the site may be subject to compaction with cattle grazing when soil conditions are wet, reducing grass nutrient utilization and increasing runoff. The claim that the combination of management of soil moisture with robust kikuyu thatch will prevent soil damage is improbable and should be further evaluated. The Draft EIS should also evaluate how manure will be kept on the pasture as fertilizer given the greater amount of runoff.

The Draft EIS should examine possible differences in grass growth and yield between research test plots without cattle and plots with rotational grazing. If the soils are currently depleted of the essential nutrients required for crop growth, reasonable estimates of yield must be used. When nitrogen is applied to meet higher yield expectations and the yields are not achieved, the excess nitrogen is likely discharged into the environment. This increases the amount of nitrogen quantity in the landscape and results in the release of greenhouse gases. Moreover, biological process involved in the nitrogen cycle make it unlikely that recovery of 100 percent of excreted nitrogen occur in an animal operation. Therefore, the Draft EIS must consider impacts associated with the "learning curve" of bringing the land from being marginal in production to being high-producing forage land. It must also define the cumulative impact of importing the nitrogen into the watershed on a recurring basis. Finally, the Draft EIS should study the impact of continuous kikuyu growth at high rates on the quality of the topsoil.

F. Botanical and Faunal Resources

In 2008, the National Park Service ("NPS") published a reconnaissance survey of Māhāʻulepū in order to provide a preliminary evaluation of the resources of Māhāʻulepū for potential inclusion in the national park system. According to NPS, habitats for five endemic endangered birds are scattered throughout Māhāʻulepū. *Id.* at 19. The endemic endangered birds known in the area are the Hawaiian coot (*ʻalae keʻokeʻo*), common moorhen (*ʻalae ʻula*), Hawaiian duck (*koloa maoli*), Hawaiian stilt (*aeʻo*), and the Hawaiian goose (*nēnē*). *Id.* Intermittent streams and wetlands at Māhāʻulepū provide habitats for these birds, and nēnē and koloa are known to frequent the taro lease land in Māhāʻulepū valley. *Id.* The broad natural depression in this valley fills with water after heavy rain and draws many water birds, including sixty koloa during one such event. *Id.* The wetlands in Māhāʻulepū valley are also hydrologically linked to the Makauwahi Cave complex, a critical habitat for endangered arthropods that rely on seepage of nutrient-rich water. *Id.* at 29.

According to NPS, "[b]ecause sensitive conservation areas are mingled with active agricultural land throughout the study area, future activities on agricultural land could cause major impacts on significant sources." *Id.* at 52. NPS concluded that the natural and cultural resources of Māhāʻulepū "are deemed nationally significant. These areas encompass unique geologic landforms and fossils, rare species and habitats, and storied sites important to native Hawaiian and United States history." *Id.* at 49.

The Dairy's impacts on the species in the immediate area must be studied in the Draft EIS. In particular, the Draft EIS should:

- Evaluate the impact of increased nutrients in wetlands and groundwater to impact the endangered arthropods that live in the Makauwahi Cave complex.
- Evaluate the impact of construction on botanical and faunal resources.
- Evaluate the impact of Dairy-related transportation on botanical and faunal resources.
- Evaluate the likelihood that standing water, including the Dairy's treatment ponds will attract additional water birds, and the impacts on water birds from the Dairy's operations. Water birds are attracted to areas with sufficient water levels and vegetation to promote breeding and foraging. Even intermittent streams may attract Hawaiian water birds to the site.
- Evaluate the likelihood that open pasture and wetlands will attract nēnē, aeʻo, the Hawaiian duck or other species, and the impacts on those species from the Dairy's operations.
- Evaluate the likelihood that wetlands, water and the Dairy's wastewater treatment ponds will attract feral mallards (*Anas platyrhynchos*), which post the most important threat to the Hawaiian duck by hybridization.
- Describe any nighttime lighting for the Dairy's operations and evaluate the impacts of nighttime lighting on endangered seabirds (including the threatened Newell's shearwater (*Puffinus aricularis newelli*) and endangered Hawaiian petrel (*Pterodroma sandwichensis*) and the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*).
- Describe the Dairy's use of electric fencing and barbed wire, and evaluate the impacts of electric fencing on avian species and the hoary bat.
- Use presence/absence heterodyne bat detector and visual surveys to quantify the number of Hawaiian hoary bats in the Dairy area.
- Evaluate the impacts of vegetation foraging or removal or other potentially disruptive activities on the wetlands and state waters in the Dairy area.

- Evaluate restoration of Dairy land at the end of the Dairy lease period to prevent typical reversion to domination by the large African grass known as Guinea grass (*Panicum maximum*; Carpenter, 2008), which are then invaded by the fast-growing tree known as albizia (*Falcateria molucana*).
- Consult with the USFWS to determine whether USFWS intends to designate the Dairy area as critical habitat for any floral, faunal or insect species in its intended upcoming designation of critical habitat on Kaua'i.
- In addition, the intended "assessment of arthropods/vector insects (e.g., flies" in the Draft EIS should include and assessment of the likelihood of wind patterns transporting these insects to the Poipu Bay Golf Course, the Grand Hyatt Hotel and other properties in the Po'ipū area.

In addition, the Dairy should evaluate its inability to mitigate impacts on avian species. For other Kaua'i projects, the USFWS has required that, "If a Hawaiian waterbird or Hawaiian goose is observed in the vicinity of project operations, all harvesting and other activities that may be disruptive will cease until the bird(s) disperse from the area through their own volition." *See* Letter from USFWS to Green Energy Hawaii, LLC dated October 3, 2011. Unlike the harvesting operations contemplated by Green Energy Hawaii, which could cease, Dairy operations cannot. In other words, without an alternate location on Kaua'i to which the cows can be moved, the Dairy will not be able to remove all cows from the facility until birds disperse of their own volition, and the birds will continue to be impacted by Dairy operations. The Draft EIS must evaluate the Dairy's inability to implement mitigation measures required by USFWS of other Kaua'i projects.

Since Dairy construction has already begun, and test fields are already in operation (EISPN at 2-2), it is too late for the Dairy to evaluate the impacts of these activities on flora and fauna. This evaluation, however, should have preceded agency decisionmaking regarding these activities, as required by Chapter 343. The Draft EIS must evaluate this failure.

G. Comprehensive Nutrient Management Plan

The Comprehensive Nutrient Management Plan (or Conservation Plan), which was apparently approved by the U.S. Department of Agriculture's Natural Resources Conservation Service, contains information essential to the EIS. The information contained in the Plan may be important to the extent it relates to the Dairy's impacts on the environment. It should be referenced in and attached to the Draft EIS so that its content is available to the public for review and comment as part of the EIS process.

IV. CONCLUSION

The approvals and permits purportedly already received by HDF for its Dairy are invalid. Such approvals and permits, if any, should have been preceded by the EIS and should be the result of the EIS process. To attempt the reverse, would turn the EIS process on its head. An

after-the-fact EIS undermines the very purpose of the EIS process. HDF cannot be allowed to circumvent Hawaii's environmental laws.

Moreover, it is not enough for HDF to repeatedly assert there will be no discharge. Just because HDF says so isn't sufficient for the EIS process. The Māhā'ulepū area, including the ground water and nearby Class 1 waters, are pristine and irreplaceable, and any discharge will cause irreparable damage. Once the harm has been done, any remedies will be wholly lacking and unsatisfactory. HDF proposes a highly intensive use of the land, and the Dairy will directly affect both the quality and quantity of runoff water that inevitably will find its way into the streams, wetlands and ocean or seep into the groundwater table. Because the Dairy will have such widespread effects, Kawailoa Development requests that it become a consulted party.

Very truly yours,

Lisa Bail

LAB

cc: Jun Fukada, Kawailoa Development LLP
Virginia Pressler, Director, Hawai'i State Department of Health

Encl.: Hawai'i Dairy Farms' Individual Wastewater System permit

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P.O. Box 3378
Honolulu, Hawaii 96801-3378

4/23/2014

COPY

James Turturici
Kodani & Associates
3126 Akahi St.
Lihue, HI 96766

Dear Sir/Madam:

Subject: Individual Wastewater System (IWS) for
Owner/Lessee: Hawaii Dairy Farms LLC
Project Site: Hawaii Dairy Farms, Koloa, HI
TMK: 429003001
IWS File No.: 51486 (Septic Tank)
Old File No.: N/A

The subject wastewater plans have been reviewed by the Wastewater Branch for conformance to applicable provisions of Hawaii Administrative Rules, Title 11, Chapter 62, entitled Wastewater Systems. The IWS plan conforms to applicable provisions of Chapter 11-62.

The Department of Health will sign an applicable county building permit application provided that all information submitted as part of the IWS plan and county building permit application are consistent with each other and meet applicable provisions of Chapter 11-62 at the time of permit signature.

As the professional engineer responsible for the design of the above wastewater plan, it is your responsibility to inform the owner/lessee of the property that:

A) The IWS plans must be attached to each set of permit construction plans, or provided to the contractors.
B) The IWS must be installed by a licensed contractor holding an A, C9, C-37, C-37a or C43 license, and
C) The IWS must be inspected by the engineer, and authorized in writing by the Department before use.

Should you have any questions, please feel free to contact Lori Vetter at 241-3323

Sincerely,

Sina Pruder

SINA PRUDER, P.E.
Chief, Wastewater Branch

GROUP 70
INTERNATIONAL

May 26, 2016

Law Offices of Goodsill Anderson Quinn & Stifel
On behalf Kawailoa Development LLP
P.O. Box 3196
Honolulu, Hawai'i 96801

Subject: Hawai'i Dairy Farms Environmental Impact Statement (EIS) Preparation Notice
Māhā'ulepū, Kōloa District, Kaua'i, Hawai'i
Response to Friends of Māhā'ulepū Comments

Dear Ms. Bail:

Thank you for the input dated February 23, 2015 representing Kawailoa Development LLP's comments on the Hawai'i Dairy Farms Environmental Impact Statement Preparation Notice (EISPN). We acknowledge your comments about the project, and offer the following responses.

HDF seeks to establish and operate a sustainable, rotational-grazing pasture dairy farm in Māhā'ulepū Valley on the island of Kaua'i to produce fresh, locally available nutritious milk for Hawai'i families. The rotational-grazing method utilizes 100 percent of the cows' manure as fertilizer for pasture grass to provide the primary source of nutrients. This cost-effective method will reduce reliance on imported fertilizer and feed. Pasture grass will provide a local food source appropriate for cow health and quality milk production, and will initially comprise 70 percent of the animals' diet.

I. EIS Process

HEPA and HRS

As you are aware, Hawai'i Dairy Farms (HDF) stepped forward in response to community concerns about the dairy in the Po'ipū area and offered to prepare a comprehensive Environmental Impact Statement (EIS) for the proposed project. It is the purpose of Hawai'i's environmental law, known as HRS Chapter 343 and "HEPA", to "*establish a system of environmental review which will ensure that environmental concerns are given appropriate consideration in decision making along with economic and technical considerations.*" The HEPA process includes scoping discussions with regulatory agencies and the community to identify issues of concern. HDF engaged technical consultants to analyze probable impacts on environmental and societal conditions. Relevant local, state and federal ordinances, statues, and regulations were considered. We believe the EIS demonstrates that this innovative dairy system will benefit the local and statewide community by advancing food sustainability.

HDF is in compliance with Chapter 343 requirements because none of the permits that have been obtained or the reviews that were completed triggered the

requirements for an environmental assessment or and an EIS. The EIS being prepared by HDF therefore is not an "after the fact" EIS.

Chapter 343 would be triggered if an agency were to approve a wastewater treatment unit and the approval was a discretionary consent. However, the State of Hawai'i Wastewater Branch never approved the Waste Management Plan (the "WMP") submitted by HDF. It reviewed the WMP pursuant to Hawai'i Administrative Rule § 11-65-07.1, which sets forth the requirements for non-domestic wastewater. The rule states that the director of the Department of Health or the director's duly authorized representative "will review" the use and disposal of non-domestic wastewater. The WMP was for non-domestic wastewater. The position of the State of Hawai'i Wastewater Branch, with which HDF concurs, therefore is that the review of the WMP did not trigger Chapter 343. Similarly, the U.S. Department of Agriculture Natural Resources Conservation Service only reviewed but did not approve HDF's Conservation Plan.

The approval of the County of Kaua'i Building Permit, the County of Kaua'i's determination that HDF is exempt from the Grading, Grubbing and Stockpiling ordinance of the State of Hawai'i's Wastewater Branch's approval of the Individual Wastewater System were also not discretionary approvals for wastewater treatment units.

HDF nevertheless decided to prepare an EIS in response to community concerns about potential environmental impacts from a dairy farm with up to either 699 or 2,000 mature dairy cows. The purpose of an EIS is to provide disclosure of the environmental effects of a proposed project and HDF wants the community and the State of Hawai'i to have the benefit of disclosure of its proposed project.

HDF Proposed Action

HDF is committed to establishing a herd of up to 699 mature dairy cows, and demonstrating the rotational-grazing pasture system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future.

For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. The application process for a National Pollutant Discharge Elimination System (NPDES) Concentrated Animal Feeding Operation (CAFO) permit includes public notification and input. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is currently estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

Hawai'i Dairy Farms (HDF) is a privately funded project on privately owned land and does not meet any of the nine "triggers" as stated in Hawai'i Revised Statues Chapter 343, also known as the Hawai'i Environmental Policy Act. HDF is submitting an Environmental Impact Statement in order to show project information to address concerns expressed by the local community.

Alternatives

The EIS evaluates alternatives that could attain the objectives of the action's purpose and need, and compares environmental benefits and potential impacts of each reasonable alternative against those of the proposed action. Additionally, reasonable land use alternatives that emerged from public input during the project scoping phase are documented and briefly discussed. The alternatives that do not meet the project purpose are not advanced for further. The Environmental Impact Statement Rules, Hawai'i Administrative Rules Chapter 11-200 (HRS 11-200) requires a discussion of alternatives that could attain the objectives of the action, regardless of cost. There is no requirement for the alternatives analysis to consider every possible land use. Further discussion of alternatives can be found in Draft EIS Chapter 6.

Four alternatives that do not meet the project purpose are discussed. Two of those alternatives would not be viable given existing zoning and private land tenure: rezoning the land for resort or residential development; or a potential conservation condemnation. These two alternatives are briefly explained and eliminated from analysis. Two additional alternatives were considered as reasonable land uses as they could be permitted within the existing State Land Use Agricultural District and County Agricultural Zoning District. These options include an Agricultural Park with Processing Center, and development of an Agricultural Subdivision. The alternatives are examined but eliminated from further analysis, as they would not fulfill the project purpose.

The analysis, therefore, focuses on alternatives that meet the project purpose. Rigorous exploration and evaluation of the environmental impacts of the alternatives, including those that might enhance environmental quality or avoid, reduce or minimize some or all of the adverse environmental effects, costs and risks. These alternatives include: (1) the development of a Conventional Feedlot Dairy (a non-pasture-based dairy) at the same location; (2) development of the Pasture-Based Dairy at an Alternative Location on Kaua'i; and (3) milk products processing by HDF. The alternative of "No Action" is also evaluated.

Although the alternatives are potentially reasonable uses under existing zoning and neighboring uses, each fails to fulfill the requirements defined with the four established Evaluation Criteria and eight Project Objectives (Chapter 2, Sections 2.3.3 and 2.3.4):

Project Objectives (Section 2.3.3):

1. Provide more than 1,000,000 gallons annually of fresh, nutritious milk for Hawai'i families at affordable prices and revitalize the dairy industry in Hawai'i.
2. Apply proven, sustainable rotational-grazing pasture system and state-of-the-art technology to reduce reliance on costly imported fertilizer and feed.
3. Grow local, quality grass as a primary feedstock optimal for dairy cow nutrition and health, utilizing results of forage research conducted at five sites across four Hawaiian Islands.
4. Design facilities to provide animal comfort, including maximum time on pasture and minimal milking time.
5. Effectively integrate dairy operations within the island community setting.
6. Optimize dairy product shipping and marketing.
7. Provide local farming employment and build the agricultural economy.
8. Protect and enhance the area's natural, cultural, social and economic environment through sound agricultural planning, preservation of open space and protection of sensitive resources, and development of economic benefit.

Evaluation Criteria (Section 2.3.4):

1. Secure sufficient contiguous land area under long-term lease with adequate water supply (including potable water to meet standards under milk rules), suitable soil properties, gentle slope conditions, and road accessibility.
2. Generate new long-term employment in the agricultural sector on Kaua'i in a wide range of positions including pasture agronomy/soils science, veterinary and animal husbandry, environmental resources management, milk/milk products processing and dairy business management.
3. Create a model for dairy operations utilizing IAL, demonstrating the importance of long-term agricultural leases and capital investment for agricultural infrastructure to advance food self-sufficiency.
4. Utilize 100 percent of manure on site as nutrients to grow forage for dairy cows. Grow sufficient forage to provide 70 – 85 percent of feedstock required for the herd.

The essential differences as compared to the proposed action are highlighted in the following.

• Only one of the alternative actions (conventional feedlot alternative) would create a commercial-scale dairy operation in Hawai'i, with the capability to produce 10 percent of the State's fresh milk demand, reducing dependence on imported milk (Objective I). This alternative, however, would not reduce reliance on costly imported fertilizer and feed (Objective 2); grow local, quality grass as a primary feedstock (Objective 3); and would not utilize 100 percent of manure on site as nutrients to grow forage for dairy cows (Criteria 4).

• None of the alternatives would secure a dairy location that meets the requirements of a rotational-grazing pasture dairy: sufficient contiguous land area; available long-term land tenure; adequate potable water supply; suitable soil properties; gentle slope conditions; and accessibility (Criterion 1).

• One alternative (Agricultural Park) could potentially generate new long-term employment in the agricultural sector on Kaua'i in a wide range of positions including pasture agronomy/soils science, environmental resources management (Criterion 2).

• The Agricultural Park alternative could also develop sustainable food production utilizing Important Agricultural Lands, demonstrating the importance of long-term agricultural leases and capital investment for agricultural infrastructure, water systems, and support facilities (Criterion 3). However, it appears there was limited interest in such a venture after many years of trying.

• Finally, addressing the range of potential environmental impacts (natural, cultural, social and economic) (Objective 8) the three alternative scenarios would generate fewer beneficial impacts, and produce impacts that could potentially exceed those anticipated from the proposed project.

In contrast, the planned agricultural operations of Hawai'i Dairy Farms, were determined, after substantial analysis, to be the most viable option and the preferred alternative. Of all the alternatives considered, this is the only approach that meets each of the four Evaluation Criteria and achieves the eight Project Objectives.

Hawai'i Dairy Farms will create a commercial-scale, pasture-based dairy operation in Hawai'i, with the capability to provide more than 1,000,000 gallons of the fresh milk, reducing dependence on imported milk (Objective 1).

• The planned dairy location meets the requirements of minimum land area, soil properties, slope conditions, water supply, land tenure and availability, and accessibility (Criterion 1).

• The planned action will generate new long-term employment in the agricultural sector on Kaua'i, including pasture agronomy/soils science, veterinary and animal husbandry, environmental resources management, milk/milk processing, and dairy business management (Criterion 2).

• Sustainable food production utilizing Important Agricultural Lands (Criterion 3) will occur with the proposed action, demonstrating the importance of long term agricultural leases, and the ability to draw capital investment for agricultural infrastructure including water systems and support facilities (Criterion 3).

• Address the range of potential environmental impacts by utilizing 100 percent of manure as natural fertilizer to grow the majority of food for cows (Criterion 4). The

alternatives evaluated would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.

• Creating an economically viable rotational-grazing pasture model maintains agriculture, retains open space, and provides buffer between highly utilized resort and residential development and sensitive natural or cultural resources (Criterion 5).

Discharge
HDF will establish and operate a sustainable, pastoral, rotational-grazing dairy farm in Māhā'ulepū Valley on the island of Kaua'i to produce fresh, locally available nutritious milk for Hawai'i families. The rotational-grazing method utilizes 100 percent of the cows' manure as fertilizer for pasture grass to provide the primary source of nutrition. This cost-effective method will reduce reliance on imported fertilizer and feed. Pasture grass will provide a local food source appropriate for cow health and quality milk production, and will comprise at least 70 percent of the animals' diet.

Manure refers to both urine and feces, and is accounted for in the analysis of nutrient impacts. For a description of surface water discharge, refer to the section, following. The EIS contains a discussion of herd management and offsite herd management in Chapter 3, Sections 3.4 and 3.7.

II. Groundwater
Groundwater Impacts
HDF will utilize an onsite well for potable water that was established a century ago to serve the sugarcane plantation. The last of the 14 field wells developed between 1897 and 1928, it is the deepest of the wells drilled through alluvial material to reach the aquifer deep within the volcanic series (refer to Draft EIS Section 4.16.2 and Table 4.16-1 Information on Wells In and Near to Māhā'ulepū, Kaua'i). The battery of wells produced 3 MGD during use for sugarcane irrigation.

Four new onsite wells were installed by HDF to access groundwater in the alluvium to facilitate an analysis of hydrologic connectivity and to establish baseline water quality conditions. All of the wellheads are several feet above ground level; there will be no wellhead inundation of any wells installed by HDF, or the wells installed by the sugar plantations that HDF has located.

As part of the groundwater assessment conducted by Tom Nance Water Resource Engineering (TNWRE), pump tests were conducted to determine whether there is any relationship between two groundwater bodies in the area: in the shallow alluvium of the valley floor; and the aquifer in the deep unweathered volcanic series. The assessment determined there is no hydrologic connection (see additional detail in the Draft EIS Section 4.16.1).

The groundwater and surface water analysis determined that the modest potable water use rate for dairy operations, and the 4,500-foot distance between the Māhā'ulepū 14 well and the nearest County potable water well (Kōloa Well F), will

result in no adverse impacts to ongoing use of groundwater in the unweathered volcanic series, which is the source of potable water

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow waterbodies in the Māhā'ulepū Valley alluvial material, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent or commercial fertilizer will be applied, and no animals will graze in the area. The four wells installed to facilitate confirmation of the disconnected hydrology of groundwater in the shallow alluvium on the valley floor will be used in the future for monitoring of water quality. Baseline data of nutrient and chemical constituents are documented as Appendix E to the EIS. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kaua'i community.

Pond Storage during Heavy Rains
For the committed herd size of 699 mature dairy cows, the storage pond could accommodate nearly one million gallons more than the NRCS design requirements (**Error! Reference source not found.**). In normal operations, the storage pond provides additional spare volume at the top of the pond. In the 699-cow scenario, the spare volume is an additional 45 percent of the total volume design. In the 2,000-cow scenario, the spare volume represents an additional buffer of up to 12 percent. An emergency containment berm with capacity for an additional 30 days is included in the design. This design exceeds regulatory requirements, with containment in excess of the major rainfall events recorded in the valley over the past three decades.

A natural disaster plan has been prepared by the Hawai'i Dairy Farms' manager to address hurricane, fire, and potential flooding hazard scenarios. HDF is not in a tsunami inundation area, so this scenario is mentioned in the disaster plan only for HDF personnel to maintain awareness. The disaster response plan outlines safety procedures during the event, follow up actions, and emergency contacts for assistance before, during or following the event.

Animal Mortality
Should animals die at the site, they will be buried at a designated area, following plans for carcass management as specified in the Waste Management Plan reviewed by DOH.

Nutrient Balance
Nutrient management is the practice of managing the amount, rate, source, method of application, and timing of plant nutrients and soil amendments. The NRCS Conservation Practice Standard 590 (referred to as Standard 590), Nutrient Management, is applied to commercial fertilizers, organic by-products, waste water, organic matter, and irrigation water. The timing and application of nutrients should correspond as closely as practical with plant uptake, soil properties and weather conditions.

A Technical Service Provider knowledgeable in NRCS Conservation Practices was retained to work with HDF technical advisors in determining a nutrient balance for the Māhā'ulepū site. Application of manure can be beneficial to soils by improving organic matter, increasing infiltration of water, and improving the soils' ability to support pasture growth and root establishment.

As the cattle excrete on the Kikuyu thatch, nutrients are incorporated into what is effectively an organic net. Healthy soils contain primary decomposers such as earthworms and dung beetles that move manure into the soil profile when they burrow, aerating the soil to make organic materials accessible to secondary decomposers. Secondary decomposers include microbes (microorganisms) such as bacteria, protozoa, and fungi. The decomposition process breaks down manure into nutrient components that are readily available for uptake by the grass crop. In a healthy system, a manure pile can be removed from the soil surface within 24 hours. Even with the applied manure and effluent nutrients, the grass will need significant additional nutrients from conventional fertilizers to maintain optimum grass growth and yield goals with 699 mature dairy cows.

The contemplated herd size of 699 mature dairy cows would produce manure both within paddocks and in the milking parlor, providing additional organic nutrients and reducing the requirement of supplemental commercial fertilizer. EIS Chapter 3, Section 3.5 identifies the nutrient demand of the pasture crop across the 470 acres of grazed pasture, and applies the nutrients available from the committed herd size of 699 mature dairy cows to determine the remaining nutrients required from commercial fertilizers. Approximately 30 percent of the nitrogen and 36 percent of the phosphorus required annually would come from the committed herd size, requiring nearly 70 percent of nitrogen and 64 percent of phosphorus to come from commercial sources (see EIS Section 3.5, Table 3.5-1).

The NRCS Nutrient Management Standard provides a phosphorus leaching index for Hawai'i soils. The leaching potential for each soil type at HDF is low, with an index value of 10 to 18 which is well below the upper index value of 30 still considered low. The moderate index ranges from 30 to 90, and the high index is for values above 90. Under the NRCS Nutrient Management Standard, on low risk soils, phosphorus can be applied at rates greater than crop requirements, not to exceed the nitrogen requirement for the succeeding crop, if manure or other organic materials are used to supply nutrients. Since the grass crop is not newly planted for each rotation and the growing season is constant and year-round, the phosphorus application is planned to be managed and adjusted to not exceed the crop requirement rate.

As a conservative estimate, the nutrient mass balance for the contemplated herd size assumes the grass yields do not increase. As shown in the EIS Section 3.8, the percentage of nitrogen provided by animals is 88.3 percent, an increase of 57.8 percent over the amount provided by the committed herd size to a total of 88 percent of the crop demand (shown in Table 3.8-1). The percentage of phosphorus increases by 68.4 percent from the amount provided by the committed herd size, to provide

approximately 104 percent of the plant requirements. Several management options exist to keep phosphorus and other nutrients in balance, which may include and are not limited to: improved soil health from initial additions of phosphorus, reduction in contemplated herd size to approximately 1,875 mature dairy cows, or the expected increase in the grass yields from 16.3 tons of DM per acre per year to 20 tons of DM per acre per year (though an increase to 17.3 tons of DM per acre per year would be sufficient to bring phosphorus applications back into balance with crop demand and eliminate any phosphorus overage). Higher grass yields would demand additional phosphorus. Nitrogen from commercial fertilizer would be required at both 1,875 and 2,000 mature dairy cows.

It should be noted and planned that the *commercial* fertilization requirements to maintain high forage productivity and soil health can exceed the simple arithmetic difference between the nutrients applied by manure and the forage uptake. Rather, these values only represent the net amount of nutrients that need to be provided to and utilized by the crop through *commercial* fertilization, beyond the nutrient that is available to the crop from *manure* sources. Fertilization, especially the application of commercial nitrogen, can be inefficient with actual requirements with respect to forage production, and fertilization needs can be as much as 25 to 50 percent greater than the arithmetical difference resulting from a mass balance calculation - due to volatilization or soil sorption as mentioned above. Refer to the soils and agronomy analysis prepared by Russell Yost and Nicholas Krueger, University of Hawai'i at Mānoa College of Tropical Agriculture and Human Resources (CTAHR), EIS Appendix C.

III. Surface Water

Water quality maps available on the Hawai'i State Department of Health website with a date of June 2014 and labeled "Draft" do not reflect the current Hawai'i Administrative Rules (HAR) §11-54, Water Quality Standards. Per §11-54-5.1 Inland water areas to be protected, and §11-54-6 Uses and specific criteria applicable to marine waters, all waters to be protected are listed in Appendices A, B, and C (dated July 1, 2014) of the HAR. No inland waters in the Māhā'ulepū watershed are included in the HAR §11-54 Appendix A. Therefore, no Class 1 Inland Waters exist in or around the HDF site. Marine waters downgradient from the HDF site fall into open coastal waters Class A, as no embayments, marine waters, or open coastal waters in the area are included in the appendices of HAR §11-54 for special protection.

The aquatic features of the HDF site were described during the flora-fauna survey by Eric Guinther of AECOS Consulting. The description is contained in the flora-fauna survey report in Appendix A of the EIS. The HDF site is located on the bottom-land of the upper Māhā'ulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Ha'upu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhā'ulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed

reservoir, and continues off site towards the south. Many of the aquatic features just described are shown on the USFWS National Wetlands Inventory (NWI) and assigned codes that describe the habitat type presumed by the Inventory (most information in the NWI was derived from aerial photographs and maps, not field investigations. All of the water ditches on the property (and the *'auwai* around the margin of the valley floor) are coded "R4SBCx", which represents: intermittent (seasonally flooded) flowing water, in an excavated channel. An exception is the ditch (and channel upslope) directing stream flow off Kāmaulele, which is coded R3RBH: an upper perennial stream with a rock bottom. However, this characterization is unlikely, according to AECOS. According to CWRM, there are no perennial streams in the Māhā'ulepū watershed. Refer to EIS Chapter 4, Section 4.17, and Appendix A, *Flora and Fauna Surveys Conducted for the Kauai Dairy Farms*.

Complaints from the public citing high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted the State of Hawai'i Department of Health (DOH) Clean Water Branch to conduct a "Sanitary Survey" of the Māhā'ulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*.

The findings of the Sanitary Survey indicate that high levels of enterococcus and *Clostridium perfringens* occur in sediment of Waiopili Ditch. Soil has been identified as a primary source of fecal indicator bacteria in the environment, and can be transported by precipitation into even pristine streams and rivers. The agricultural ditch and intermittent streams showed degraded water quality parameters for nutrients and pathogens. Elevated levels in these water courses is due to the low flow conditions and varied inputs from the agricultural lands and natural contributions from the watershed. Water inputs to the agricultural ditches come from a watershed area surrounding the Māhā'ulepū Valley, including the sloped areas from Hā'upu.

Surface water runoff mitigation measures include implementing controls and best management practices to avoid, control, and trap potential erosion associated with construction activities. Any stormwater discharge associated with construction in the short-term will be in compliance with relevant regulations. A Stormwater Pollution Prevention Plan (SWPPP) has been developed for the site to document controls and BMPs to avoid, control, and trap potential erosion associated with construction activities. The SWPPP is required as part of the application for the NPDES – Construction Stormwater General Permit, and specifies that any discharge in compliance with relevant regulations. EIS Section 4.17.4 discusses probable short-term impacts and mitigation related to stormwater run-off.

Over the long-term, adherence to the Conservation Plan and best management practices includes setbacks to minimize impacts to waterways. The setback for effluent application is 50 feet from each side of surface waters. Perimeter fencing to exclude cows from surface waters provides a 35-foot buffer on either side of the drainageways. Vegetative buffers will be maintained within the 35-foot setback from

the drainageways. Specific stormwater controls to be implemented in the long-term include and structural controls, and are discussed in the EIS Section 4.17.4. After dairy establishment and when cows are on pasture, periodic sampling will enable comparison to ensure nutrient balance objectives are met (see EIS Section 3.3.3, Nutrient Balance).

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Po'ipū region were also calculated. Nitrogen input to the marine environment in the Po'ipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Po'ipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

HDF has initiated a long-term ocean water quality monitoring program in conjunction with groundwater and surface water quality monitoring, to regularly sample and analyze nutrient and chemical constituent levels in the nearshore marine waters. The ongoing testing program will provide feedback to the dairy management team regarding changes in water quality. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kaua'i community.

The hydrologic assessment is included as Appendix K. The groundwater engineer and Nutrient Balance Analysis (NBA) utilize the Evapotranspiration Maps obtained from UH Manoa Department of Geography. A detailed irrigation schedule will be developed, evaluated, and adjusted with water quality monitoring. Irrigation systems are designed to utilize a droplet size that delivers water on the crop. No irrigation during windy conditions.

IV. Air Quality

Dust Emissions

Dust will be generated as cows move along soft limestone walkways that connect the paddocks and lead to and from the milking parlor. Potential emission rates were estimated from published literature, where particulate matter (PM) is measurable from the "drylots" of confined dairy operations where animals walk over dirt and dried manure throughout the day. Using emission rates from the published literature therefore greatly overestimates potential emission from HDF, as cows in a rotational-

grazing pasture system will spend only two hours each day moving along cow walkways.

Using atmospheric dispersion modeling system (AERMOD), the rates were scaled to the size of the non-pasture areas used by cows at HDF. Results were added to the background concentration of particulate matter (both PM_{10} and $PM_{2.5}$) measured on the island of O'ahu. This was considered the total impact and was compared to the State ambient air quality standards. Only the contemplated herd size of up to 2,000 milking cows was modeled, as at the lower threshold of 699 cows the potential fugitive dust impact would be negligible.

The estimated concentration for PM_{10} is 2.01 $\mu g/m^3$ per 24-hour period, which is well below the State standard of 150 $\mu g/m^3$. The estimated concentration for $PM_{2.5}$ is 0.23 $\mu g/m^3$ per 24-hour period, which is well below the Federal standard of 35 $\mu g/m^3$.

The estimated total annual particulate matter emissions were also for PM and greenhouse gases (GHGs). Total annual emissions (in tons per year) are typically estimated for potential permitting applicability. Results of the estimate for a herd size of 699 mature dairy cows for PM was 0.6 tons per year, and 3.3 tons per year for a potential future contemplated herd size of up to 2,000 mature dairy cows. The project will not require any permits under the Clean Air Act, or State of Hawai'i counterpart.

Flies

Fly populations at HDF will be minimized through a process known as Integrated Pest Management (IPM). Essentially, IPM disrupts reproduction with appropriate means at key points in the pest's life cycle. Used in Hawai'i for decades, a number of invertebrates and a bird (the cattle egret) were introduced between 1898 and 1950 to reduce livestock-related insects. IPM utilizes knowledge of the ancient food web among species.

An especially important insect to minimize fly breeding habitat in manure is the dung beetle, which buries manure and incorporates it into the soil. Populations of dung beetles found on Kaua'i and those species already in Māhā'ulepū Valley, will increase with the increased manure food source, thus increasing and speeding breakdown of manure. Dung beetles are specialists in the very important natural process of breaking up and quickly recycling bovine manure pads. The behavioral diversity among dung beetle species will work together to bury dung pats in one to three days, a shorter amount of time than the 10-30 days flies eggs need to hatch.

In the Kōloa-Po'ipū region, pest fly populations are dependent upon food and breeding sources nearby such as dog, cat, and chicken feces. Beef cattle graze in the region on agricultural lands along Ala Kinoiki Road between Kōloa and Po'ipū, and it is likely the livestock-related flies identified at the HDF site occur in this region as well. Localized controls to reduce pest populations need to address breeding sites in and amongst the food and animals wastes within the area. These mitigation measures will make it difficult for flies to breed, and BMPs will be enforced to

address any increase in population, therefore it is expected that the dairy farm will not significantly affect recreational and resort areas.

Odor

Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF, so air dispersion models were used to determine potential odor levels. Local weather data was used in conjunction with the AERMOD modeling system, and published rates for manure odors emissions for dairy heifers and effluent ponds were adapted to reflect the HDF facilities.

Odor isopleths (a line used to map all points having the same numerical value) were created to display the models findings. Modeling results were generated for worst case meteorological conditions (low wind velocity / mixing). Results for the committed herd size of 699 milking cows show that odors may be detectable by 50 percent of the population once per 200 hours, or 44 hours per year, within an area that extends approximately 1,670-feet (within one-third of a mile) beyond the dairy farm boundary, and does not reach recreational or residential areas. Results for the contemplated expanded herd size of up to 2,000 mature dairy cows show odors would not extend beyond 2,780 feet outside the HDF boundary (just over half a mile), again not reaching recreational or residential areas, and again with detection limited to 50 percent of the population approximately 44 hours per year.

The parameters used in the analysis were intentionally conservative, and the impacts shown assume an unlikely confluence of worst-case meteorological data, irrigation location, and grazing location. Actual offsite odor impacts are likely to be much lower and/or less frequent than shown; it is likely odor detection beyond the HDF boundaries will be less frequent.

Manure in the effluent storage ponds have a short residence time and will not be covered. Therefore, HDF will not create a contained source of gases that could be released inadvertently.

V. Socio-economic conditions

The potential impacts of Hawai'i Dairy Farms to the existing economy and property values in the South Kaua'i area were evaluated for the EIS. EIS Section 4.15 includes the complete presentation of socioeconomic conditions, and economic and fiscal impacts; the technical report is included as Appendix J of the EIS.

Hawai'i Dairy Farms would contribute to diversification of Kaua'i's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on Hawai'i Island), only 10 percent of Hawai'i's milk is locally supplied. The Hawai'i Dairy Farms project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately one million gallons of milk annually.

Short-term benefits will be created by development of Hawai'i Dairy Farms through jobs for local construction personnel and local material suppliers. Construction employment would be expected to average about 12 jobs annually during the development period. Such jobs would include equipment operators, cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, supervisors, painters, etc. Based on State employment multipliers, indirect employment related to Dairy construction would be expected to average about 16 jobs on Kaua'i, and another 8 indirect jobs on O'ahu. Thus direct-plus-indirect employment association with Dairy development would be expected to average approximately 36 jobs, of which 28 would be on Kaua'i.

Once the facility is established and dairy operations have reached the committed herd size, approximately 11 direct and indirect full-time equivalent jobs would be sustained on Kaua'i, including 5 farm jobs and about 6 indirect jobs. An additional 3 indirect jobs would be created on O'ahu. For the contemplated herd size direct and indirect employment will roughly double.

Construction of the facilities at HDF would contribute approximately $9.1 million per year during the development phase. This includes direct equipment and construction expenditures, and indirect sales related to construction. Once fully operational with a herd of 699 mature dairy cows, annual direct-plus-indirect sales are estimated annually at $8.1 million on Kaua'i, with an additional $2 million on O'ahu.

Economic impacts of nuisance issues that could affect property values were examined. With a long history of agriculture, most of Kaua'i has a rural ambiance. Most homes and visitor units on the island are within one mile of some agricultural activity; the rural character adds to the appeal of the island. The site of the Grand Hyatt Kaua'i was rezoned from agriculture to resort; the resort opened in 1992 while sugarcane was still grown just mauka of the hotel property.

Sugarcane fields bordered Kōloa on three sides, and bordered parts of Po'ipū. Sugarcane fields were burned prior to harvest, creating smoke; dust and soil runoff followed field disturbance; and large canehaul trucks created considerable noise, dust and cane litter. The Kōloa Sugar Mill emitted odors, smoke and noise. The distance of the mill to the nearest homes in Kōloa is approximately 0.8 mile; proposed dairy activities would be 2.5 miles from the nearest home in Kōloa. An agricultural transition to seed crops utilized land adjacent to the Po'ipū Bay Resort Golf Course. Dust from disturbed, open lands was an issue, and concern of herbicide use drifting offsite dominated community conversations. Dust from proposed HDF operations would be minimal with grass as the cover crop.

With the demise of sugar and seed crops in Kōloa and Po'ipū, the cattle grazing for the beef market is now the dominant use of agricultural land in the region. Grazing lands to the east, north and west of Kōloa total over 2,900 acres, which is reduced from over 3,300 acres before Māhā'ulepū Valley was leased by HDF. In the near term, grazing is likely to expand onto most of the lands used recently for seed crops. In Kōloa and Po'ipū, grazing occurs less than 200 feet from some homes, less than 1

mile from some visitor units, less than one-third of mile to the east and west of the main commercial area of Kōloa, and less than 200 feet from a golf course.

Many of the homes in the region that are near cattle operations are in the northeast and eastern sections of Kōloa; most of the homes were built before 1980 and are of modest size (less than 1,200 square feet). For these homes, the 2016 median assessed values ranged from $406,100 to $567,500. At the western end of Po'ipū is Kukui'ula—a luxury residential community that abuts grazing land. Most of the homes are newer, built after 2012, and most are large at over 2,100 square feet. For 2016, median assessed values of these residential lots and homes ranged from $1,297,150 for a lot, to $2,893,100 for a lot with home. Clearly, beef cattle operations are compatible with nearby homes, commercial areas, resorts and recreational areas. Although stocking densities are lower for beef cattle on unirrigated pastures than they are for the proposed dairy on irrigated pastures, the operations are similar: cattle are rotated among pastures as limited by the carrying capacity of the land.

Results of technical studies and the findings of the EIS show no unmitigated nuisances that would affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will reach resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area. The dairy will help maintain the existing rural character and ambience of the Kōloa-Po'ipū region.

<u>Offsite Milk Processing</u>
Under the proposed action, Hawai'i Dairy Farms (HDF) would sell raw milk wholesale to a processor and packager. Milk processing, including pasteurization, bottling, and packaging of milk, would be done independently of HDF. Milk was previously processed on Kaua'i by Meadow Gold at a facility in Puhi. The facility was closed in 2000. The facility could be retrofitted by Meadow Gold or in cooperation with Meadow Gold, the state's only current milk processor and bottler with operational facilities on O'ahu and Hawai'i Island. One option for retrofitting the existing facility could be to pasteurize milk on Kaua'i, then ship the pasteurized milk to another island for processing and packaging. Another option could be to retrofit the existing facility to bring the milk to market by pasteurizing, bottling, and packaging on Kaua'i. This would be similar to the process for milk from the two existing dairies on Hawai'i Island, where the majority of milk produced and processed is also sold on Hawai'i Island. In addition to fluid milk, other milk products such as soft cheeses and yogurt could be produced as added-value products.

Alternatively, a new proposed facility could be sited on lands with appropriate zoning for milk processing, without a need for obtaining additional special permits. A determination of the best options will be made by the processor prior to instigation of HDF's operations.

Pasture Grasses
Kikuyu grass was introduced to Hawai'i in 1925 and is one of the most important pasture and range grasses in the State. Cultivation of pasture grasses at the HDF site will not extend the range of introduced grasses to native-dominated areas. Activities at HDF will not impact any areas dominated by native vegetation offsite, either upper elevation forests or coastal strand vegetation.

VI. Soils and Topography
Facility design utilizes guidance from the Natural Resources Conservation Service (NRCS), National Engineering Handbook (NEH) and from the American Society of Agricultural and Biological Engineers. Conservation practices established in NRCS technical guidance are incorporated both into the design and construction, including the animal walkways (Pacific Islands Area - PI - Code 575), the access road and waterway crossing (Codes 560 and 578), and heavy use area protection (PI Code 561).

The existing major drainage ditches on the site will be maintained. Within the 10-acre dairy facility area, swales will be installed as part of the drainage design to route stormwater run-off according to best management practices for livestock operations. In the pasture area, previously installed swales for agriculture and low-lying areas may be smoothed or filled in accordance with NRCS Practice Code for Land Smoothing, to improve surface drainage and uniformity for grazing.

Existing farm roads and cow raceways will be elevated above the pasture grade. Surfaces will be slightly crowned to ensure drainage to either side of the road or raceway and swales roughly 12-inches in depth will be created parallel to each road or raceway. Design and installation of roads, raceways and swales will be in compliance with the HDF Conservation Plan and utilize standards from applicable NRCS Practice Codes. Changes to topography, including improved drainage, are not anticipated to be significant over the long-term. See the EIS, Chapter 4, Section 4.2.

The classification of soils as poorly drained indicates the relatively slow rate of water movement within soil and to surrounding areas. Poorly drained is not an indication of low or poor infiltration. Infiltration refers to the ability of water to enter the soil surface, whereas "drainage" refers to the movement of water within or from the soil profile. Poorly drained soils typically have low hydraulic conductivity.

Soils classified as poorly drained often exhibit anaerobic conditions. Anaerobic conditions typically result in higher rates of denitrification, which is the conversion of nitrate and nitrite to gaseous forms. This essentially reduces the potential for nitrate impacts on nearby waterbodies. As a result of reduced movement of water through the soil profile, the mobility of nutrients such as potassium and phosphorus is usually reduced as well. In this way "poorly drained" soils may represent less risk of nitrate and nitrite harm to associated water bodies than "well drained" soils.

VII. Botanical and Faunal Resources
The botanical survey describes vegetation on the HDF site as typical of regularly disturbed land. The land has been under extensive cultivation for decades; no native plants habitat exists on site. The EIS Sections 4.9 and 4.10 address the evaluation of flora and fauna resources, with technical studies in Appendix A.

The botanical survey of the dairy property conducted in August 2014 by AECOS Consulting assessed existing plant species. The survey described that the present and historical uses of the area for intensive agriculture very much limit the natural botanical resources anticipated to occur. Complete species lists are included in the EIS, and no rare or protected botanical species, or intact native plant communities, occur on the project site. No long-term impacts to native plant habitats or endangered or threatened plants species will occur as a result of the dairy. Best management practices as part of the Conservation Plan to reduce erosion and stabilize slopes of the drainageways will include vegetated buffer strips along the drainage ways. Where native plants occur or could survive if planted, native plants will be used in the vegetated setbacks along drainageways.

Avian and mammalian surveys were conducted in August 2014 by Rana Biological Consulting, Inc. This survey was conducted to assess the potential presence of avian or mammalian species currently listed as endangered, threatened or proposed for listing under either Federal or the State endangered species lists. The survey covered the dairy site area and immediate vicinity. Common birds and terrestrial mammals were encountered on the property. There is no critical habitat for endangered species in the upper Māhā'ulepū Valley.

Four species of endangered waterbirds were recorded on the site and at the nearby taro farm located within the HDF site, though the area does not provide critical habitat. Nēnē were also seen on the site, and DOFAW biologists have noted they are regularly seen on the subject property. It is probable that some nest on or adjacent to the site as this species nests in the general Kōloa area, and the habitat present on parts of the site is suitable for nēnē nesting.

The principal potential impacts posed to these four waterbird species include those potentially associated with construction activities, and those associated with dairy farm operations following build-out. Measures will be adopted to avoid potential seabird and nēnē goose collisions with fences and structures. Potential measures include lowering construction cranes at night, using conservation fencing to protect specified areas, marking tall structures and fencing with white visibility polytape, limiting nighttime lighting, and shading any outside lights used at night. Ongoing mitigation strategies will be implemented for day to day preventative measures, including an Avian Species Protection Plan. Mitigation measures are further described in DEIS Section 4.10.2.

It is also likely that Hawaiian hoary bats overfly the project area on a seasonal basis. While caution will be taken during any potential disturbance or vegetation removal,

there are almost no suitable roost trees within the dairy site, thus it is not expected that the dairy farm will affect this listed mammalian species.

Arthropods
A study of invertebrate species and pest insects was conducted in January 2016 by Steven Lee Montgomery, PhD, Consulting Biologist. There are no known caves or lava tubes found at or adjacent to the dairy farm property. The Kōloa Lava Tube System, which provides habitat for two endemic cave species, the Kaua'i Cave Wolf Spider and the Kaua'i Cave amphipod, is located several miles away from the dairy farm property. Both invertebrates are listed as endangered under the U.S. Endangered Species Act. Not all caves in the Kōloa area contain these invertebrates, as most caves in the Kōloa District do not contain the optimal climatological conditions required by these organisms. Neither the botanical and faunal survey nor the invertebrate survey revealed any evidence of lava tubes or caves on the property, and no such features have been reported for the area near the HDF site. Thus no cave invertebrate species will be affected by the dairy farm.

United States Fish and Wildlife Service (USFWS)
Hawai'i Dairy Farms has notified the USFWS regarding the location, scope, and intent of the dairy project. According to its EISPN response letter, it has no intent to designate any parts of the dairy area as critical habitat for any flora or fauna species.

Effluent ponds will be surrounded by non-vegetated surfaces which are not expected to provide appropriate cover for nesting birds. Should birds be attracted to the effluent ponds, HDF will cover the ponds.

Fencing is discussed in Section 3.5.1 of the Draft EIS. A perimeter fence will be constructed of 42-inch hog wire topped with a strand of straight wire at 48-inch height to avoid entanglement with bats or birds. Barbed wire will be secured at ground level to deter rooting and entry by feral pigs. Interior paddock fencing will consist of two or three strands of electric wire mounted on wooden t-posts. Electric fences are more effective than wire fences at keeping cattle within paddocks. Fence design and construction will follow NRCS practice standards for the region.

Per the previous paragraph, many of the aquatic features described on the USFWS National Wetlands Inventory (NWI) are assigned codes that describe the habitat type presumed by the Inventory, as most information in the NWI was derived from aerial photographs and maps, not field investigations. According to CWRM (2005, 2008), there are no perennial streams in the Māhā'ulepū watershed.

VIII. Comprehensive Nutrient Management Plan

The Conservation Plan was prepared by qualified technical consultant in accordance with NRCS technical guidance. For policy reasons, NRCS Conservation Plans are confidential documents.

Conclusion
The proposed dairy farm will achieve the objective of increasing current local milk production and bolstering Hawai'i's declining dairy industry while reducing reliance on imported milk from the mainland United States. The rotational-grazing pasture dairy system will utilize manure on-site as fertilizer to grow grass, reducing imported fertilizer and feed, and minimizing potential impacts to the environment. The dairy farm will comply with all applicable federal, state, and county policies in plans in regards to land use, environmental protection measures, and other associated regulatory controls. Overall, the project provides long-term benefit and support of agricultural lands and industry through continued use in keeping with zoning and IAL designation.

Your letter and this reply will become part of the public record and be appended to the Draft EIS. This response letter accompanies your copy of the Draft EIS. Should you prefer an electronic copy of the Draft EIS, it can be found on the OEQC website: http://tinyurl.com/OEQCKAUAI. Search "Hawai'i Dairy Farms" to find the published Draft EIS.

Thank you for your participation in the environmental review process.

Sincerely,
GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

cc: Hawai'i Dairy Farms
Hawai'i State Department of Health,
Environmental Planning Office

From:	Sarah Matsumoto
To:	laura.mcintyre@doh.hawaii.gov; HDF
Cc:	Charlie Tebbutt; Daniel Snyder
Subject:	Friends of Maha"ulepu"s Comments on Hawai"i Dairy Farm"s EISPN: comments and correspondence attached
Date:	Monday, February 23, 2015 11:36:40 AM
Attachments:	2015.2.20 EIS Scoping Comments-Friends of Mahaulepu signed comments.pdf 2015.2.23 Letter to DOH.pdf

Dear Ms. McIntyre:

Attached, please find Friends of Maha'ulepu's Comments on Hawai'i Dairy Farm's Environmental Impact Statement Preparation Notice. These comments were mailed to you last Friday via Certified Mail to 1250 Punchbowl Street, Honolulu, HI, 96813. As an added precaution, an additional copy of the comments is being mailed to you today to 919 Ala Moana Blvd., Room 312, Honolulu, HI, 96814. The attached letter, dated today, is a cover letter for that mailing.

Thank you,

Sarah A. Matsumoto

**PLEASE NOTE NEW E-MAIL ADDRESS: Sarah@tebbuttlaw.com

Sarah A. Matsumoto
Associate
Law Offices of Charles M. Tebbutt, P.C.
941 Lawrence St.
Eugene, OR 97401
t: 541-344-3505 | f: 541-344-3516
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Law Offices of Charles M. Tebbutt, P.C.
941 Lawrence Street
Eugene, OR 97401
Ph: 541-344-3505 Fax: 541-344-3516

February 23, 2015

Via Certified Mail, Return Receipt Requested:

Laura McIntyre
State of Hawai'i
Department of Health
919 Ala Moana Blvd., Room 312
Honolulu, HI 96814

Via US Mail to:

Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, HI 96813

Jeff Overton
Hawai'i Dairy Farms, LLC
PO Box 1690
Koloa, HI 96756-1690

Also via e-mail to: *HDF@Group70int.com*
laura.mcintyre@doh.hawaii.gov

RE: FRIENDS OF MAHA'ULEPU'S COMMENTS ON HAWAI'I DAIRY FARM'S ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE, DATED JANUARY, 2015 – copy to alternative Dept. of Health mailing address and request to become a consulted party

Dear Ms. McIntyre,

On behalf of Friends of Māhā'ulepu (hereinafter abbreviated as "FOM"), please see the enclosed scoping comments concerning Hawai'i Dairy Farm's ("HDF") January, 2015 "Environmental Impact Statement Preparation Notice" or "EISPN." These comments were mailed via Certified Mail on Friday, February 20, 2015, to you at the following Dept. of Health address: Laura McIntyre, State of Hawai'i, Department of Health, 1250 Punchbowl Street, Honolulu, HI, 96813. As a precautionary measure, FOM is hereby submitting a second copy of its comments to you at the address listed above (comments enclosed). While it is clear from FOM's comments that FOM would be affected by HDF's proposed dairy and should be included on the EIS distribution list,

FOM hereby explicitly requests to become a consulted party as provided by Hawai'i Administrative Code § 11-200-15(b).

The enclosed comments also were sent via Certified Mail on Friday, February 20 to Group 70 International, Inc. and Hawai'i Dairy Farms at the addresses above. In the interest of conserving paper, a second copy of FOM's comments is not included in this correspondence to those entities.

Sincerely,

_____
Sarah A. Matsumoto
Law Offices of Charles M. Tebbutt, P.C.

Encl. to Dept. of Health: 2/20/2015 Friends of Māhā'ulepu's Comments on Hawai'i Dairy Farm's "Environmental Impact Statement Preparation Notice"

No encl. to HDF or Group 70, Inc.

Law Offices of Charles M. Tebbutt, P.C.
941 Lawrence Street
Eugene, OR 97401
Ph: 541-344-3505 Fax: 541-344-3516

February 20, 2015

Via Certified Mail, Return Receipt Requested:

Laura McIntyre
State of Hawai'i
Department of Health
1250 Punchbowl Street
Honolulu, HI 96813

Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, HI 96813

Jeff Overton
Hawai'i Dairy Farms, LLC
PO Box 1690
Koloa, HI 96756-1690

Also via e-mail to: *HDF@Group70int.com*
laura.mcintyre@doh.hawaii.gov

RE: FRIENDS OF MAHA'ULEPU'S COMMENTS ON HAWAI'I DAIRY FARM'S ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE, DATED JANUARY, 2015.

Dear Ms. McIntyre,

This firm represents the Friends of Māhā'ulepu (hereinafter abbreviated as "FOM"). FOM is a grassroots, not-for-profit corporation dedicated to protecting and preserving the Māhā'ulepu Valley and Kaua'i. In furtherance of its mission, FOM hereby submits its scoping comments concerning Hawai'i Dairy Farm's ("HDF") January, 2015 "Environmental Impact Statement Preparation Notice" or "EISPN." After reviewing and responding to these comments, FOM believes that the State, the Department of Health, and HDF will recognize that the construction and operation of a 2,000-head dairy farm on Kaua'i's south shore will cause irreparable environmental, economic, and social harm. These harms far outweigh any of the alleged benefits of a dairy of this size being operated within the State of Hawai'i – especially considering that HDF will need to ship all of the milk produced by its herd off the island of Kaua'i for processing and bottling.

As an initial matter, FOM is very concerned that HDF is using the HEPA process merely to justify its already decided position that it *will* build a dairy at this location. The EIS process, of course, is designed to determine *whether* an action should occur given the environmental, social, economic, and cultural impacts. HDF has put the cart before the horse, assuming that approval for an already decided project will occur. The EIS process is not intended to be used as a justification for a decision already made. This is not the way HEPA works, and FOM anticipates that HDF will reconsider its position once the full gamut of negative consequences of a large dairy being placed in the Māhā'ulepu Valley come to light.

In addition to a proper HEPA process, HDF must research the various local, state, and federal ordinances, statutes, and regulations that may impose additional requirements on its proposed dairy operations. HDF identified some of these in its EISPN, including the Hawai'i Constitution, Clean Air Act, and Clean Water Act. EISPN at 5-1. The EISPN did not list the Endangered Species Act, 16 U.S.C. § 1531 *et seq*., even though HDF is aware of at least four native bird species that are listed by both federal and state statutes as endangered. EISPN at 3-2. Moreover, all levels of government involved in decisions about this proposal must ensure that Hawaii's public trust obligations are protected.

FOM's scoping comments below focus on both the EISPN and HDF's "Waste Management Plan," dated July 23, 2015. Both of these documents should be considered in the EIS process. FOM also hereby fully incorporates into its scoping comments the critique and review of HDF's Waste Management Plan by Mr. Mark Madison, dated August 21, 2014 and those by Dr. Deanne Meyer, dated August 11, 2014. These documents were submitted to the Wastewater Branch of the Department of Health by Goodsill Anderson Quinn & Stifel, on behalf Kawailoa Development LLP.

I. HDF's Proposed Dairy Would Contaminate the Environment.

Despite touting that the dairy will originally house only 699 animals,[1] HDF's Waste Management Plan ("WMP") clearly indicates that this facility is being designed from the ground-up to handle 2,000 head. A November 25, 2014 press release from HDF confirms that the dairy intends to expand its herd within months of beginning operation. As such, 2,000 head should be the number that is evaluated throughout this EIS process, not the deceptively low 699 figure used by HDF in its paperwork.

Even at 699 animals, however, there can be little doubt that this facility will cause and contribute to the contamination of the environment in and around the Māhā'ulepu Valley and Kaua'i's sensitive marine ecosystem. Dairies such as that proposed by HDF have been found across the country to contaminate surface water, groundwater, soil, and air. These negative environmental consequences primarily stem from the fact that a

[1] 699 animals is no arbitrary number. HDF picked it as a staring point to avoid being labeled as a "large" dairy animal feeding operation under federal law. That threshold is reached when, *inter alia*, a dairy has 700 mature dairy cows housed on site.

mature dairy cow produces significantly more waste than other animals. In fact, the U.S. Environmental Protection Agency estimates that a facility with 2500 dairy cattle creates a similar waste load as a city of 411,000 people. This means that HDF's 2,000 dairy cows will produce, on average, the same amount of waste generated by a human population of 328,800. By way of comparison, the entire population of Kaua'i is 65,689 as of 2008. Stated differently, HDF's proposed dairy would create five times more waste than the *entire human population* of Kaua'i. Unlike human waste, however, which is required to be treated, HDF will dump the waste created by its herd directly onto the 517 acres of land it has secured for grazing.

The pollution that originates from HDF's proposed facility will impact a variety of environmental media. Each is discussed in turn below, and each must be fully addressed by HDF in its EIS.

A. The Proposed Dairy Would Contaminate Surface Waters, Detrimentally Impacting the Environment.

HDF's proposed 2,000 head dairy will cause contamination of surface waters – waters that eventually discharge into the ocean near Gillin's beach. Figure 5 of the WMP show both natural watercourses and man-made ditches traversing the proposed HDF site. These watercourses can properly be construed as "Waters of the State," as well as "Waters of the United States," protected by water quality standards. All of these ditches eventually lead to a stream that discharges into the ocean just a short distance away. Importantly, the area where the discharges will occur has been designated as Class 1 critical habitat by the State. Critical Plant Habitat and Critical Cave Habitat designations also crisscross this coastline. In addition to these waters, there are two identified wetlands on the site, each of which receive runoff and likely groundwater originating from the pastures.

HDF offers absolutely no analysis of how manure-contaminated water will impact the coastline, the critical habitat designations, or the Class 2 inland water that leads to the Class A marine waters along the Māhā'ulepu coastline. HDF also offers no analysis or explanation for how it will prevent such surface water discharges. It suggests that it will conduct surface water monitoring at various points, but not whether it will take steps to eliminate discharge if manure-related pollutants are detected in the samples.

This is not surprising. Dairies across the United States have been subject to Clean Water Act lawsuits for manure-related discharges into surface waters, which cause a laundry list of negative environmental and health effects. This is especially true when soils contain clay, or are classified as "poorly drained" or unsuitable for receiving large amounts of animal waste by the Natural Resources Conservation Service ("NRCS"). Sloped locations, such as exist on the site, present a high likelihood of irrigation water and/or manure water runoff.

Here, the HDF site is composed of soils identified as "poorly drained" by NRCS, including Ka'ena Clay and Kalihi Clay soils, which comprise approximately 60% of the

total soil.[2] In fact, according to a NRCS custom soil resource report for the project area, virtually all of the soils underlying the site have "very limited" capacity for disposal of manure through irrigation. "Very limited" soils have "limitations [that] generally cannot be overcome without major soil reclamation, special design, or expensive installation measures…[p]oor performance and high maintenance can be expected." HDF ignores this point, insisting that the soils in the facility area are conducive to manure applications, *which is simply not true.* HDF should be required to conduct a detailed soil survey of the site to evaluate whether manure can be applied to its fields in a manner that is environmentally protective. Based on the NRCS soil survey, this does not appear likely.

Additional soil complications can be traced to the soil's high susceptibility to surface water runoff. Again, the NRCS states that the various soil types in the project area have anywhere from a "medium" to "very high" likelihood of surface runoff. This means that any excess water left on a field from manure applications and/or irrigation water applications can transport water – and the manure constituents contained therein, including those deposited by the herd within each pen – into surface waters and, from there, into the ocean.

Finally, the topography of the site also presents risks to surface water. Water naturally flows downhill. HDF's WMP contains a topographical map and narrative explaining how the project site slopes downhill from 150 feet elevation, to 60 feet in elevation, and finally to sea level. Manure-contaminated water will therefore flow naturally to the low points – the ditches and canals – where it will then follow the predominant surface water flow into the ocean.

Besides runoff from fields to which manure is applied, there is also a distinct concern that precipitation will also convey nutrients from the fields and into surface waters – including the various wetlands located on and around the site. While HDF claims that it will apply manure with an eye toward the weather, as any resident of the area knows, storms can be unpredictable and deposit substantial amounts of rainwater over a very short period. This also applies to HDF's proposed storage lagoons, divided into a solids settling basin and a storage pond. The settling basin will be full nearly 100% of the time, as it fills up before overflowing into the adjacent liquid storage pond. HDF should be required to explain, in detail, how its lagoons were sized to deal with a 25-year, 24-hour precipitation event in addition to average monthly precipitation depths. For instance, in September 1996, there were six days of continuous rainfall, followed by a week of intermittent rainfall, bookended with another seven days of continuous rainfall. If the dairy were approved and constructed, such a significant rainfall event could cause the lagoons to fail and almost certainly to overflow, releasing substantial amounts of manure that will eventually flow and runoff into surface waters. The EIS should anticipate the environmental and economic impacts of a catastrophic weather event, lagoon breach, or other severe emergency constituting a "worst-case" scenario at the proposed dairy. An extreme storm or earthquake resulting in a major waste discharge or

[2] HDF's characterization of the soils is incomplete and, in many instances, conflicts with the actual NRCS soil survey data.

failed lagoon would likely cause irreparable harm to the environment, even if an emergency response is executed. HDF must also address how the expected impacts from climate change will affect precipitation frequency and quantity, including the aforementioned extreme weather events.

HDF must analyze all of these points in its EIS, as well as a careful examination of what problems each manure constituent can create. For instance, excess phosphorus in surface waters can lead to eutrophication; bacterial contaminants such as E-coli and fecal coliform can render surface waters unsuitable for consumption, recreation, and other uses; and nitrogen (in nitrate form) can move into surface waters and, from there, percolate into the underlying aquifer, rendering the groundwater unfit for human use.

B. The Proposed Dairy Would Contaminate Groundwater, Detrimentally Impacting the Environment.

Similar to surface water contamination, large dairies in the United States have also been found responsible for contamination of groundwater. Groundwater contamination is especially concerning for this project, as the aquifer in the area provides potable drinking water for the County of Kaua'i Department of Water Supply. In fact, HDF's WMP does not even identify all of the wells in the project area and provides a skewed picture of how far away those wells are; for instance, while HDF claims that one county well (Koala F) is over a half-mile away, in reality it is only 750 feet from the paddock in which sludge from the settling basin is proposed to be deposited. HDF should be required to undertake an intensive groundwater study to determine the fate and transport of nitrate to the underlying aquifer. Additionally, multiple groundwater monitoring wells should be required to be installed both upgradient and downgradient of the facility to monitor whether the dairy, if approved, is impacting the groundwater. If it is, then the dairy must be required to take remedial action, including possible cessation of operation.

HDF should also be required to evaluate whether it can apply all of the manure generated by its herd on its land at agronomic rates– that is, at the rate in which manure nutrients will be removed by the crop-- that will not result in excess nutrients escaping from the property. HDF bills itself as a zero discharge operation but must prove before it starts operation, including an construction activities, that it can live up to that promise. Excess nutrients are likely to be transported deeper into the soil profile with subsequent irrigation, manure application, and precipitation, where they will eventually discharge to groundwater. Along these lines, FOM is very concerned with the estimated nutrient requirements identified by HDF in the WMP. The dairy seems to believe that its grass crop requires in the neighborhood of 750 lbs./ac nitrogen yearly to be sufficiently fertilized. This is an excessively high number, and one that does not appear to be reflected in the literature for Kikuyu grass. If the grass does not use all of the nitrogen supplied by manure applications, then it will lead to contamination of the groundwater.

Additionally, the liner proposed by HDF for its lagoons is inadequate for this area, considering the numerous vital environmental and cultural resources nearby. HDF

indicates it will line its lagoons with a 1.5 mm HDPE lining with 5 mm bidim. FOM does not believe that the liner proposed by HDF will sufficiently stop seepage from the lagoons into groundwater given the concerns with the liner welds and potential punctures from installation and lagoon cleaning. Indeed, after conducting an intensive groundwater monitoring and modeling study, HDF may determine that is simply not feasible to put *any* type of manure storage lagoon in this area.

Finally, HDF needs to analyze how manure storage and applications will interact with the wetlands on and nearby the project site. It appears that the wetlands and, indeed, much of the project site itself, comprise a large portion of the watershed that feeds the aquifer – an aquifer relied upon for clean, safe drinking water. If manure is not agronomically applied, then excess manure nutrients, including nitrate and phosphorus, will runoff into surface waters and leach through the soil and into groundwater. But even if agronomically applied, some manure constituents will wind up in the aquifer. Nitrate, for instance, will move through the soil almost at the speed of water, such that any excess or residual nitrate after manure is applied is likely to leach deeper into the soil and eventually into the aquifer. Once it moves past a crop's root zones – for Kikuyu grass, this is a very shallow area – the excess nitrate will reach groundwater. It is only a matter of time. The concentration of nitrate in the aquifer may be further impacted by HDF's proposal to draw 3 million gallons of water per day from Grove Farm wells; as water is drawn for use in the dairy's daily operations, the concentration of nitrate in the aquifer will increase. An investigation into whether the aquifer can support the proposed use of groundwater for daily operations should be conducted and included in the EIS.

Additionally, the withdrawal of 3 million gallons of water per day from an already-sensitive aquifer presents its own concerns. HDF must analyze whether the significant water drain its proposed dairy will have is sustainable in light of limited supply of fresh water provided by this aquifer.

C. The Proposed Dairy Would Contaminate the Air, Detrimentally Impacting the Environment.

The host of environmental concerns presented by dairies as large as the one proposed by HDF does not end with water resources. Large dairies generate significant amounts of hazardous airborne contaminants that can impact air quality, such as ammonia, hydrogen sulfide, mercaptans, particulate matter, and airborne pathogens, to name just a few of the more than 20 hazardous air pollutants (HAPs) emitted by animal feeding operations of the size proposed.[3] Ammonia is one of the primary contributors to the degradation of air quality around large dairies. Ammonia is known to cause a variety of health impairments, discussed in greater detail below, which is why it has been

[3] EPA has identified at least 168 chemical compounds in manure and in the air around livestock operations. In addition to the 20 HAPs, EPA also identified over 160 Volatile Organic Compounds (VOCs). *Emissions From Animal Feeding Operations, Draft*, U.S. Environmental Protection Agency, Emission Standard Division, Office of Air Quality Planning and Standards, EPA Contract No. 68-D6-0011, August 15, 2001.

designated an extremely hazardous substance by the United States Environmental Protection Agency. Hydrogen sulfide is a similarly designated hazardous substance released by dairies, and can also cause serious health risks, especially for the very young and very old. Recent literature also suggests that dairy-related pathogens have the capability of binding to particulate matter and then moving off-site with wind, where it can cause major health problems in nearby populations. And, of course, nobody enjoys the noxious odors that are created by large dairies. The horrendous smell of HDF's proposed dairy would leave downwind residents gasping for fresh air.

Air contamination from the dairy will also contribute to climate change. Fossil-fuel consumption and emissions by and from dairy-utilized vehicles, and emissions of greenhouse gases (GHGs) such as methane and nitrous oxide that result from the high number of cows and quantities of stored manure will exacerbate the already-urgent problem of the warming of the planet. The EIS should consider the degree of contribution that HDF's proposed dairy would have on GHG levels in the atmosphere and climate change.

Because of these (and potentially other) air quality issues, HDF should conduct an extensive air modeling survey to evaluate the impacts its facility will have on nearby residents and tourists. Each contaminant must be carefully analyzed to determine its potential impacts on residents and the environment.

D. The Proposed Dairy Would Harm Threatened, Endangered, and Culturally Significant Species.

Besides degrading various environmental media – the South Shore's land, air, and water – HDF's dairy will also result in harm to threatened, endangered, and culturally significant species. Pollution from large dairies like that proposed by HDF has been shown to change and degrade habitat and result in the destruction of other species, through both direct (e.g., contaminated water) and indirect (e.g., species die-off as a result of eutrophication) effects.

Kikuyu grass, slated to be the "primary" food source for the dairy cows, is known to be an extremely aggressive crop, and may crowd out other species. It is considered a weed pest in some areas. *See, e.g.*, http://www.ipm.ucdavis.edu/PMG/PESTNOTES/pn7458.html. There is a risk that, if not properly managed and contained, the kikuyu grass could spread to neighboring parcels and crowd out native plant species. The EIS should explain how HDF plans to contain this aggressive plant. And although the Kikuyu and Kikuyu-Guinea grasses are slated be the cows' primary food source, the importation of any other crops for food sources present a risk that diseases and other invasive species will be introduced to the island. HDF should analyze the degree of risk posed to native plant and animal species by its proposed use of Kikuyu grass and other feed material.

Further, the entire coastline where discharges from the proposed dairy will enter the ocean is protected critical habitat. This habitat is home to a variety of native

Hawaiian species. HDF must present a detailed analysis evaluating how its dairy could potentially impact all of the species that live in this protected corridor. Special attention should be paid to *Sesbania tomentosa*, commonly referred to as ‘ohai, a type of endemic coast vegetation that is a listed federally endangered species and a State of Hawai’i Species of Greatest Conservation Need. The critical habitat designation along the Māhā’ulepu coastal corridor is meant, at least in part, to provide assurance for the continued existence of this species – a continuation that is seriously threated by the presence of a 2,000 dairy farm upstream. Other federally endangered species that require investigation in the EIS include *Anas wyvilliana* (Hawaiian Duck, Hanama’ulu); *Branta sandvicensis* (Hawaiian Goose, Nene); *Fulica alai* (Hawaiian Coot); *Gallinula chloropus sandvicensis* (Common Moorhen); and *Himantopus mexicanus knudseni* (Hawaiian Stilt, Ae’o). This list is not meant to be all-inclusive; it is incumbent upon HDF to conduct a thorough analysis of how its dairy could potentially impact all surrounding species, not just those that are federally endangered.

Similarly, animal waste has been shown to cause localized impacts on ocean acidification, and resulting impacts on wildlife of the broadest spectrum. These impacts must be addressed on their own as well as from cumulative impacts from climate change.

Finally, although the dairy cows themselves are not a protected species, a risk to the health of the herd exists due to the number of cows occupying a small area. As discussed above, it is clear that HDF plans to house up to 2,000 dairy cows in relatively short order. The EIS should include a discussion of potential risks to the health of dairy cows including risks for rapid spread of illness and disease based on the size of the herd and physical confinement or housing.

II. HDF’s Proposed Dairy Would Substantially Affect Economic and Social Welfare.

A. The Proposed Dairy Would Significantly Impact Important Cultural and Historic Sites and Resources.

In traditional Hawaiian culture, natural resources and cultural resources are considered one and the same. A spiritual connection exists between people and their surroundings, including the land, water, and sky. Māhā’ulepu is a traditional Hawaiian ahupua’a, or socioeconomic/geologic/climatic subdivision of land, running from the Ha’upu mountain range to the shoreline on Kaua’i’s southeast coast. In 2006, the National Parks Service identified certain natural and cultural resources in this area, which hold historical significance for the native Hawaiian population and provide recreational and other enjoyment opportunities for visitors. Those resources include: the undeveloped shoreline corridor from Makawehi northeastward through Māhā’ulepu and Kipu Hai to Nawiliwi Bay; the Hule’ia National Wildlife Refuge and historic Alekoko Fishpond along Hule’ia Stream; and parts of the Ha’upu mountain range overlooking these areas. NPS Study at 1. Hawaiian burials have been found along coastal sand dunes, and historic petroglyphs occur on Māhā’ulepu beach and on Grove Farm agricultural lands in Māhā’ulepu Valley. NPS Study at 38.

An industrial dairy like that proposed by HDF has the potential to significantly disrupt and damage the ability of the Hawaiian population to appreciate and enjoy their traditional cultural resources. Damage due to construction and increased industrial development and traffic, air and water pollution, and potential loss of species in these culturally-significant areas could lead to profound spiritual and emotional harm to those who value these areas for their cultural and historical significance. The EIS should investigate the presence of historical and cultural sites in and around the proposed dairy operation and conduct an intensive evaluation of how those sites may be affected; for example, whether and to what extent the ability of individuals to grow or gather traditional plants such as taro would be impaired.

B. The Proposed Dairy Would Have Significant Social Impacts.

HDF’s industrial-sized dairy may cause additional social impacts to the population at large. Increased noise and traffic during the construction phase and during the dairy’s daily operations will negatively affect quality of life for people living near the dairy and in areas receiving increased dairy-related vehicle traffic. The aesthetic and recreational value of areas in and around Māhā’ulepu would be diminished by the presence of an industrial dairy, especially from pollution of surface water and coastal waters traditionally used for recreation. The EISPN identifies certain traditional activities which take place along the Māhā’ulepu coast, including hiking, hunting, fishing, and gathering. EISPN at 3-3. A comprehensive evaluation of potentially-affected recreational activities would also include bird and animal watching, nature walking, wildlife photography and beachfront activities such as surfing, snorkeling, stand-up paddleboarding, and scuba, among others. For example, when water with elevated levels of nitrate and phosphorus reaches the coastal shoreline it will alter the pH, temperature, and chemical makeup of the existing marine water. In turn, coastal marine plant and animal life will suffer. A loss of wildlife and drastic alteration of the makeup of the marine nearshore ecosystems would diminish the enjoyment of individuals who recreate in the Māhā’ulepu Valley area and along Kaua’i’s southern coastline, and may cause some of those individuals to cease those activities altogether. The EIS should consider the effects that HDF’s proposal would have on noise levels and visual and recreational interests in and around the proposed project area.

Finally, the need for employees (both short and long term) to construct and operate the CAFO would have impacts on the regional demographics and related social support services. The EIS should consider the impacts that HDF’s proposed dairy would have on the local population, demographic trends and needs.

C. The Proposed Dairy Would Have Significant Negative Economic Impacts.

HDF’s proposed project would significantly affect the local economy. As the EISPN recognizes, Māhā’ulepu is located in the Po’ipū area, which is one of two major tourist and luxury home destinations on Kaua’i. EISPN at 3-3. Concerns about water and air quality, increased noise, health risks, impacts on native plant and animal species

(both in the proposed project area and in the affected coastal areas), discussed elsewhere in these comments, in the Māhā'ulepu Valley and Po'ipū area would reduce the desirability of the area as a place to live, work, and visit.

The resident population of Kaua'i is presently in the range of 63,000-70,000.[4] The approximately 2500 people (EISPN at 3-3) who reside within the Koloa- Po'ipū Census tract are likely to see their home and property values diminish significantly if a large dairy is operating just a few miles away; property values elsewhere throughout the Māhā'ulepu Valley and around Kaua'i may similarly decline. The EIS should conduct a thorough evaluation of the effects that a 2,000-cow dairy operation will have on land and home values in the area.

The tourism industry on Kaua'i will also be greatly affected by the presence of a large dairy. Area resorts, hotels, and independent vacation rentals, as well as the recreational facilities, shops, and restaurants that cater to visiting tourists, are all likely to experience a decline in visitors—and consequently, income—if the desirability of the Po'ipu area and Māhā'ulepu Valley as a vacation and recreation destination is diminished. The 2008 NPS Study estimated that, at that time, Kaua'i experienced a daily visitor population of about 21,000 tourists. NPS Study at 6. Those visitors infuse money into the local economy by renting hotel rooms and vacation properties, buying meals and souvenirs, and purchasing recreational experiences, such as a sightseeing tour or surf or paddleboard class. Visitors to Kaua'i also frequently arrive by boat, with both local and international cruise lines including the port of Nawiliwi, among others, as a sailing destination. Itineraries including ports of call on Kaua'i would likely lose some of their attractiveness when it becomes known, through sites, smells and other impacts, that an industrial dairy is operating mere miles from one of the island's major resort areas.

Regardless of the method of travel, some tourists will be reluctant to visit a destination—presently known for being the lush and verdant "Garden Island"—on which a large, industrial dairy operates, and the EIS should thoroughly evaluate the ways in which the HDF project would affect the thriving tourism industry.

D. The Proposed Dairy Raises Infrastructure Concerns.

HDF's proposed dairy will require substantial energy consumption, both during construction and daily operations. The EISPN indicates that some electrical power will be generated through the use of rooftop photovoltaic panels, but provides no information about the estimated number of panels or what the expected kilowatt output of those panels will be. The EIS should include a detailed analysis of the proposed dairy's electricity demands and a realistic estimate of any on-site electricity generation. Because on-site power generation will not be available until the photovoltaic panels are installed and functional—or in the event that HDF determines that on-site power generation will

[4] The EISPN notes that the 70,000 figure is "slightly above the total population," while a 2008 National Parks Service Report on Māhā'ulepu estimates that the island has about 63,000 residents. NPS Study at 6.

be insufficient to meet the dairy's demand—an evaluation of impacts on Kaua'i's utility resources must be undertaken and included in the EIS.

The EIS also should include a thorough characterization of the site and evaluate whether any historic uses (legal/formally recognized or otherwise) render the site inappropriate for a dairy operation. For example, the EIS should investigate whether and to what extent the site may have been used as a landfill or for waste disposal, and whether any hazardous or solid wastes remain on the property. If HDF determines that solid or hazardous wastes are present, it may reconsider the suitability of this location for milk production.

III. HDF's Proposed Dairy Would Substantially Affect Public Health.

HDF's proposed project raises multiple public health concerns that must be thoroughly researched and carefully considered. While the examples below are not meant to be an exhaustive list, at minimum, the EIS should include an in-depth investigation of the risks posed to public health by virtue of the proposed dairy's potential contamination of water and air, and the potential that the dairy will serve as a source of vectors for disease transmission.

A. Groundwater and Surface Water Contamination Resulting from HDF's Proposed Dairy Would Threaten Public Health.

Nitrate found in drinking water sources presents risks to human health. In recognition of these risks, the EPA has established the Maximum Contaminant Level (MCL) of nitrate at 10 mg/L. *See* http://water.epa.gov/drink/contaminants/basicinformation/nitrate.cfm. Infants, pregnant women, the elderly, and persons with compromised immune systems are particularly vulnerable to harmful health consequences of consuming water with elevated levels of nitrate. Infants below the age of six months who consume water with elevated levels of nitrate may experience shortness of breath and become seriously ill, and if untreated, may die. *Id*. Maternal exposure to environmental nitrate may increase the risk of pregnancy complications, such as anemia and preeclampsia. *See, e.g.*, U.S. Department of Health & Human Services, Agency for Toxic Substances and Disease Registry, "ATSDR Case Studies in Environmental Medicine Nitrate/Nitrite Toxicity," at 53 (Dec. 5, 2013). Epidemiologic studies of adverse health outcomes and high nitrate levels in drinking water have reported an increased risk of hyperthyroidism from long-term exposure to nitrate levels above the MCL, specifically between 11 mg/L and 61 mg/L. Burkholder, J. et al. "Impacts of Waste from Concentrated Animal Feeding Operations on Water Quality." Environ. Health Persp. Vol. 115, No. 2 pp. 308-312 (Feb. 2007).

Further, even nitrate levels **below** the MCL of 10 mg/L may be cause for concern; nitrate at levels less than 10 mg/L has been associated with insulin-dependent diabetes, and increased risk for adverse reproductive outcomes, including central nervous system malformations and neural tube defects, have been reported for drinking water nitrate levels less than 10 mg/L. Accordingly, some public health experts believe that the MCL

for nitrate is set too high to effectively protect human health from known or anticipated adverse health effects. As discussed above, the potential for land-applied and stored manure to result in elevated levels of nitrate in groundwater is high. Potential mitigation through the use of reverse osmosis systems or other filtration may ameliorate the risk to a certain degree, but even those systems are not necessarily effective: they must be maintained properly to provide protection to the residents of the home, and there is evidence that high levels of nitrates may not be fully removed by reverse osmosis systems. *See, e.g.*, J. Schoeman, "Nitrate-nitrogen removal with small-scale reverse osmosis, electrodialysis and ion-exchange units in rural areas," Water SA, Vol. 35 No. 5 (Oct. 2009). Furthermore, reverse osmosis systems deplete natural minerals from water that can cause the filtered water to damage existing plumbing systems and strip important micronutrients from the human body.

Industrial dairies like that proposed by HDF also present public health concerns due to the risk of surface water contamination to river and stream ecosystems. Increased amounts of phosphorus and nitrogen in surface waters--resulting from agricultural runoff--may lead to large algal blooms, which cause a variety of illnesses in humans. *See, e.g.*, http://www.cdph.ca.gov/healthinfo/environhealth/water/pages/bluegreenalgae.aspx. Risks to the public may occur when individuals are recreating in water in which an algal bloom is present, or from drinking water sourced from surface water in which an algal bloom is present. *Id.* Certain strains of algae, such as blue-green algae, produce neurotoxins, which are highly dangerous to humans and other species. Microorganisms in animal waste, such as E.coli and enterococcus, are also frequently present in dairy-derived agricultural runoff to surface waters and pose a threat to human health when ingested. Any veterinary pharmaceuticals or antibiotics used by the dairy will likely wind up in downstream and downgradient water sources. These pharmaceuticals and antibiotics, on their own, may present a health risk to humans and other species, but may also contribute to increased numbers of antibiotic-resistant bacteria, which are of particular concern to humans.

B. Air Contamination Resulting from HDF's Proposed Dairy Threatens Public Health.

Second, industrial dairies like HDF's proposed dairy also present multiple air quality concerns. As discussed above, stored manure emits major pollutants, including hydrogen sulfide, ammonia, airborne pathogens, and particulate matter. Exposure to ammonia can irritate the eyes, skin, and respiratory system, causing bronchiolar swelling or even tracheal/nasopharyngeal burns. The threat posed by exposure to ammonia is not taken lightly; in fact, if a dairy releases more than 100 lbs. of ammonia into the air on a daily basis, then it is required to report its releases under the federal Emergency Planning and Community-Right-to-Know Act ("EPCRA"), 42 U.S.C. § 11001 *et seq*. Exposure to hydrogen sulfide causes skin and eye irritation, and exposure in high levels may lead to even more severe health effects such as seizures, comas, and death. Releases of hydrogen sulfide are thus also required under EPRCA.

In addition to harmful air pollutants, the handling and disposal of manure and production of animal feed at industrial dairies creates airborne particles and dust, which may cause or exacerbate respiratory conditions such as asthma and bronchitis. While the airborne particles themselves pose a problem when they lodge in people's lungs and respiratory tracts, they may also serve as a mechanism for the transfer of airborne pathogens. Employees and individuals who reside near or frequently visit areas near the dairy are especially susceptible to harmful health impacts from chronic exposure to air with high concentrations pollutants and particulate matter.

Harmful air pollution may also result from the carbon emissions generated by HDF's operational vehicles. The transportation of thousands of gallons of milk (either to other Hawaiian islands or to the contiguous United States) for processing on a regular basis is certain to contribute to an increase in emissions of volatile organic compounds (VOCs) and other toxic pollutants resulting from frequent truck and tanker trips to and from the dairy. In addition to the health risks posed by the inhalation of polluted air, toxic air pollutants can be deposited onto soil and water, where they may bioaccumulate in plants or animals that are later consumed by humans as food.

C. HDF's Proposed Dairy Threatens Public Health Because it Increases the Risk of Disease Transmission.

Third, HDF's proposed dairy poses a public health risk as a means of disease transmission. The dense concentration of livestock would result in proliferating populations of rats, mosquitos, flies, and other pests. A surge in rodent an insect populations presents at least two major problems: first, swarming and biting flies and insects create a nuisance for swimmers, beachgoers, and other residents and tourists who wish to spend time in outdoor areas. Second, and more troubling, rats, flies, and mosquitos are vectors for disease transmission, and an increase in the populations of these animals increases the risk of transmission to humans. For example, the bacteria leptospirosis, already a recognized problem in freshwater streams and rivers on Kaua'i, is transmitted in the urine of infected animals; rodents and livestock are typical vectors. http://health.hawaii.gov/about/files/2013/06/leptobrochure.pdf. The livestock crowding at HDF's dairy, combined with the siting of the industrial dairy in a location with freshwater streams present increases the risk of transmission of leptospirosis and other diseases.

The potential public health threats identified above are just some examples of the types of public health risks that should be thoroughly discussed in the EIS and seriously considered by the approving agencies. To the extent that state waste management guidelines or other state laws or regulations require a plan for pest management, HDF should complete such a plan and include it in its EIS.

CONCLUSION

After HDF has an opportunity to take a hard look at all of the negative consequences of its proposed dairy, FOM believes it should abandon this ill-advised

project. Kaua'i in general, and the Māhā'ulepu Valley in particular, are extremely poor locations for intensive, industrial dairy farming. These lands should be preserved and protected, not turned irretrievably harmed.

Sincerely,

Charles M. Tebbutt
Law Offices of Charles M. Tebbutt, P.C.

GROUP 70
INTERNATIONAL

May 26, 2016

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Subject: Hawai'i Dairy Farms Environmental Impact Statement (EIS) Preparation Notice
Māhā'ulepū, Kōloa District, Kaua'i, Hawai'i
Response to Friends of Māhā'ulepū Comments

Dear Mr. Tebbutt:

Thank you for the input dated February 23, 2015 representing Friends of Māhā'ulepū's comments on the Hawai'i Dairy Farms Environmental Impact Statement Preparation Notice (EISPN). We acknowledge your comments about the project, and offer the following responses.

HDF will establish and operate a sustainable, pastoral rotational-grazing dairy farm in Māhā'ulepū Valley on the island of Kaua'i to produce fresh, locally available nutritious milk for Hawai'i families. The rotational-grazing method utilizes 100 percent of the cows' manure as fertilizer for pasture grass to provide the primary source of nutrients. This cost-effective method will reduce reliance on imported fertilizer and feed. Pasture grass will provide a local food source appropriate for cow health and quality milk production, and will comprise at least 70 percent of the animals' diet.

As you are aware, Hawai'i Dairy Farms (HDF) stepped forward in response to community concerns about the dairy for the Po'ipū area and offered to prepare a comprehensive Environmental Impact Statement (EIS) for the proposed project. It is the purpose of Hawai'i's environmental law, known as HRS Chapter 343 and "HEPA", to "*establish a system of environmental review which will ensure that environmental concerns are given appropriate consideration in decision making along with economic and technical considerations.*" The HEPA process includes scoping discussions with regulatory agencies and the community to identify issues of concern. HDF engaged technical consultants to analyze probable impacts on environmental and societal conditions. Relevant local, state and federal ordinances, statues, and regulations were considered. We believe the EIS demonstrates that this innovative dairy system will benefit the local and statewide community by advancing food sustainability.

HDF is committed to establishing a herd of up to 699 mature dairy cows, and demonstrating the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help

determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future.

For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. The application process for a National Pollutant Discharge Elimination System (NPDES) Concentrated Animal Feeding Operation (CAFO) permit includes public notification and input. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is currently estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

I. Environmental Contamination

The *Nutrient Balance Analysis* appended to the EIS documents calculations of manure output by dairy cows, using the Cornell Net Carbohydrate Protein System model. Estimates generated by the model were compared the USDA/NRCS Agricultural Waste Management Field Handbook (March 2008), which utilizes established American Society of Agricultural Engineers values.

The manure production of the size dairy cow HDF will use is 10.9 gallons per day, which equates to 0.68 gallon average per waking hour. Cows are awake approximately 16 hours per day, with 2 hours spent moving through the holding yard and milking parlor in two separate 1-hour periods. The effluent ponds will capture the portion of manure excreted during the two, 1-hour periods each day when cows move through the holding yard and milking parlor. Manure is washed from the facilities using potable water to maintain sanitation per milk rules, and is routed to the settling and storage ponds. Washwater adds approximately 17.4 gallons of water per cow per day. See Chapter 3 and Appendix D of the EIS.

The manure with washwater for the committed herd size of 699 mature dairy cows is estimated to total 13,225 gallons per day (gpd) (0.013 million gallons per day [MGD]). The quantity includes the minimal input from calves within the calf sheds. For the contemplated herd size, the total projected volume to the effluent ponds would be 37,895 gallons per day (0.038 MGD). In comparison, an estimated 1.17 MGD of wastewater disposal was processed at treatment plants in the South Kaua'i area in 2010; which is estimated to increase to 2.42 MGD by 2035. See EIS Section 4.20 for additional information.

Surface Water
HDF will utilize best management practices to minimize impacts to waterways. Perimeter fencing to exclude cows from surface waters will provide a 35-foot setback on each side of the drainageways. Vegetative buffers will be maintained within the 35-foot setback to act as filter strips to settle out any particles carried in stormwater. The setback for effluent application is 50 feet from each side of

drainageways. Additional stormwater controls to be implemented over the long-term include structural controls, are discussed in Section 4.17.4. Over the long-term, the surface water quality in the agricultural ditches and Waiopili Ditch will be improved by active management of the dairy site. Cultivation of a grass thatch for complete vegetative cover throughout the dairy paddocks will minimize currently exposed soils within the site.

State of Hawai'i Water Quality Standards Classification
Per Hawai'i Administrative Rules (HAR) §11-54, Water Quality Standards, §11-54-5.1 Inland water areas to be protected, and §11-54-6 Uses and specific criteria applicable to marine waters, all waters to be protected are listed in Appendices A, B, and C (dated July 1, 2014) of the HAR. No inland waters in the Māhā'ulepū watershed are included in the HAR §11-54 Appendix A. Therefore, no Class 1 or Class 2 Inland Waters exist in or around the HDF site. Marine waters downgradient from the HDF site fall into open coastal waters Class A, as no embayments, marine waters, or open coastal waters in the area are included in the appendices of HAR §11-54 for special protection.

After dairy establishment and when cows are on pasture, periodic sampling will enable comparison of nutrient levels to ensure nutrient balance objectives are met (see Draft EIS Section 3.3).

Nearshore Marine Water Quality
An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Analysis of chemical and physical properties of groundwater and nearshore marine water quality shows virtually no groundwater influence. Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore.

Surface water is estimated to carry three times more nutrients than groundwater moving through the alluvium on the valley floor (see following discussion, Groundwater). The groundwater and surface water analysis (Appendix E) estimates two percent of total nitrogen and one percent of phosphorus could potentially pass through the turf and soil. Given the poor permeability of the alluvium, groundwater flow would be modest. However, the groundwater level in the alluvium is approximately 80 feet above mean sea level near the HDF monitoring wells 1 and 2. The groundwater can rise in wetter periods and intersect the deep drainage ditches. Episodic, seasonal events will result in a modest amount of discharge from groundwater into the surface channel.

Applying the estimates of nutrient pass-through to the HDF operational nutrient mass balance, two percent of nitrogen pass through would total 10,000 pounds per year, and one percent of phosphorus pass through would total 900 pounds per year. Note that nutrient release from the dairy site would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major

rainfall and storm water events. Per best practices, no effluent application would be conducted during such weather events.

It is estimated that actual runoff into drainageways from HDF pasture will only occur when rainfall exceeds 0.8 inches. Based on the 30-year daily rainfall record for the area, such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. The surface water quality and marine assessment concludes there will be no adverse effect on nearshore waters from dairy operations.

The EIS section documenting potential cumulative impacts (Section 4.20.1, Interrelationships and Cumulative Environmental Impacts), provides a comparison of nutrient inputs from the adjacent Kōloa-Poi'pū region. Nitrogen additions to the near-term marine environment along the Poi'pū coastline are estimated at 38,510 pounds per year from domestic wastewater and landscape fertilization, equating to 3.5 times greater than the potential contribution from HDF; phosphorus of 1,260 pounds per year is calculated and is 1.4 times greater than the potential contribution from HDF.

HDF has initiated a long-term ocean water quality monitoring program in conjunction with groundwater and surface water quality monitoring, to regularly sample and analyze nutrient and chemical constituent levels in the nearshore marine waters. The ongoing testing program will provide feedback to the dairy management team regarding changes in water quality. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kaua'i community.

Soils

As a part of the DEIS, existing soil conditions of the project site were evaluated, along with potential impacts on soil conditions due to the proposed Dairy Farm project. EIS Section 4.3 provides an evaluation of soil conditions, and includes the soils and agronomy analysis prepared by Russell Yost and Nicholas Krueger, U.H. Mānoa, as Appendix C.

NRCS maps show the most abundant soil types occurring throughout the HDF site are Kalihi Clay and Ka'ena Clay Brown Variant. These soils underlay 32 percent and 29 percent of the dairy project area, respectively. The Kalihi series is described as "poorly drained" soils that developed in alluvium derived from basic igneous rock. The Ka'ena series is described as a very deep soil, also as poorly drained, and is primarily located on alluvial fans and talus slopes on both O'ahu and Kaua'i.

The classification of soils as poorly drained indicates the relatively slow rate of water movement within soil and to surrounding areas. Poorly drained is not an indication of low or poor infiltration. Infiltration refers to the ability of water to enter the soil surface, whereas "drainage" refers to the movement of water within or from the soil profile. Poorly drained soils typically have low hydraulic conductivity.

Soils classified as poorly drained often exhibit anaerobic conditions. Anaerobic conditions typically result in higher rates of denitrification, which is the conversion of potentially environmentally hazardous nitrate and nitrite to gaseous forms. This essentially reduces the potential for nitrate impacts on nearby waterbodies. With reduced movement of water through the soil profile, the mobility of nutrients such as potassium and phosphorus is also reduced. Soil types at the HDF site are known to adsorb and retain large amounts of phosphorus. In this way "poorly drained" soils may represent less risk of nitrate and nitrite harm to associated water bodies than "well drained" soils. The soils and agronomy report confirms the soils are suitable for nutrient application.

The NRCS Nutrient Management Standard provides a phosphorus leaching index for Hawai'i soils. The leaching potential for each soil type at HDF is low, with an index value of 10 to 18 which is well below the upper index value of 30 still considered low. The moderate index ranges from 30 to 90, and the high index is for values above 90. Under the NRCS Nutrient Management Standard, on low risk soils, phosphorus can be applied at rates greater than crop requirements, not to exceed the nitrogen requirement for the succeeding crop, if manure or other organic materials are used to supply nutrients. Since the grass crop is not newly planted for each rotation and the growing season is constant and year-round, the phosphorus application is planned to be managed and adjusted to not exceed the crop requirement rate.

Restoring nutrients to the depleted soils is the first step to improving soil tithe. Nutrients beyond the crop demand will be taken up by the soils, and will begin to rebuild levels available for plants. The dairy's focus on robust and healthy grass growth will build organic matter in soils through use of manure as a natural fertilizer. Soil can incorporate carbon from the atmosphere, which benefits soil health. According to recent studies in the Soil Science Society of America Journal, the conversion of formerly tilled cropland to grazed pasture can drive substantial accumulation of organic carbons in soil, with a potential to offset up to one-third of the annual increase in atmospheric carbon dioxide. The potential soil organic matter and carbon dioxide sequestration benefits are likely greatest in highly degraded soils in warm subtropical climates, partly due to long pasture-growing seasons.

Effluent Ponds

For the committed herd size of 699 mature dairy cows, the storage pond could accommodate nearly one million gallons more than the NRCS design requirements (EIS Section 3.3.2; Figure 3.3-6). In normal operations, the storage pond provides additional spare volume at the top of the pond. In the 699-cow scenario, the spare volume is an additional 45 percent of the total volume design. In the 2,000-cow scenario, the spare volume represents an additional buffer of up to 12 percent.

Nevertheless, the storage pond design incorporates an emergency spillway to direct overflow to a secondary containment area in case of a cataclysmic event. This

containment is beyond the regulatory requirement, and would only be utilized during an unprecedented rain or flood event. The capacity of the secondary containment is approximately 1,125,600 gallons, which is roughly equivalent to the total wastewater volume for a 30-day period from the potential contemplated herd size of up to 2,000 mature dairy cows. The design capacity of the ponds exceeds regulatory requirements, and would provide containment in excess of any major rainfall event recorded in the valley over the past three decades.

Details of effluent pond design, effluent application, and additional design safeguards are presented in Appendix D, *Nutrient Balance Analysis.*

Groundwater Findings

Four new onsite wells were installed by HDF to access groundwater in the alluvium to facilitate an analysis of hydrologic connectivity and to establish baseline water quality conditions. As part of the groundwater assessment conducted by Tom Nance Water Resource Engineering (TNWRE), pump tests were conducted to determine whether there is any relationship between two groundwater bodies in the area: in the shallow alluvium of the valley floor; and the aquifer in the deep unweathered volcanic series. The assessment determined there is no hydrologic connection (see additional detail in the Draft EIS Section 4.16.1).

The groundwater and surface water analysis determined that the modest potable water use rate for dairy operations, and the 4,500-foot distance between the Māhā'ulepū 14 well and the nearest County potable water well (Kōloa Well F), will result in no adverse impacts to ongoing use of groundwater in the unweathered volcanic series, which is the source of potable water. Further, the assessment determined there is no hydrologic connection between the aquifer in the unweathered volcanic series, the source of potable water, and the shallow groundwater body in the alluvium. Thus nutrients added by the dairy operation will have no impacts to the County drinking water well, the source of potable water within the deep volcanics.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow waterbodies in the Māhā'ulepū Valley alluvial material, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Four water monitoring wells installed by HDF into the shallow water aquifer within the alluvium will allow monitoring of water quality. Results from the monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kaua'i community.

Agronomic Nutrient Demand

Nutrient management is the practice of managing the amount, rate, source, method of application, and timing of plant nutrients and soil amendments. The NRCS Conservation Practice Standard 590 (referred to as Standard 590), Nutrient Management, is applied to commercial fertilizers, organic by-products, waste

water, organic matter, and irrigation water. The timing and application of nutrients should correspond as closely as practical with plant uptake, soil properties and weather conditions.

A Technical Service Provider knowledgeable in NRCS Conservation Practices was retained to work with HDF technical advisors in determining a nutrient balance for the Māhā'ulepū site. Application of manure can be beneficial to soils by improving organic matter, increasing infiltration of water, and improving the soils' ability to support pasture growth and root establishment.

As the cattle excrete on the Kikuyu thatch, nutrients are incorporated into what is effectively an organic net. Healthy soils contain primary decomposers such as earthworms and dung beetles that move manure into the soil profile when they burrow, aerating the soil to make organic materials accessible to secondary decomposers. Secondary decomposers include microbes (microorganisms) such as bacteria, protozoa, and fungi. The decomposition process breaks down manure into nutrient components that are readily available for uptake by the grass crop. In a healthy system, a manure pile can be removed from the soil surface within 24 hours. Even with the applied manure and effluent nutrients, the grass will need significant additional nutrients from conventional fertilizers to maintain optimum grass growth and yield goals with 699 mature dairy cows.

The contemplated herd size of 699 mature dairy cows would produce manure both within paddocks and in the milking parlor, providing additional organic nutrients and reducing the requirement of supplemental commercial fertilizer. EIS Chapter 3, Section 3.5 identifies the nutrient demand of the pasture crop across the 470 acres of grazed pasture, and applies the nutrients available from the committed herd size of 699 mature dairy cows to determine the remaining nutrients required from commercial fertilizers. Approximately 30 percent of the nitrogen and 36 percent of the phosphorus required annually would come from the committed herd size, requiring nearly 70 percent of nitrogen and 64 percent of phosphorus to come from commercial sources (see EIS Section 3.5, Table 3.5-1).

As a conservative estimate, the nutrient mass balance for the contemplated herd size assumes the grass yields do not increase. As shown in the EIS Section 3.8, the percentage of nitrogen provided by animals is 88.3 percent, an increase of 57.8 percent over the amount provided by the committed herd size to a total of 88 percent of the crop demand (shown in Table 3.8-1). The percentage of phosphorus increases by 68.4 percent from the amount provided by the committed herd size, to provide approximately 104 percent of the plant requirements. Several management options exist to keep phosphorus and other nutrients in balance, which may include and are not limited to: improved soil health from initial additions of phosphorus, reduction in contemplated herd size to approximately 1,875 mature dairy cows, or the expected increase in the grass yields from 16.3 tons of DM per acre per year to 20 tons of DM per acre per year (though an increase to 17.3 tons of DM per acre per year would be sufficient to bring phosphorus applications back into balance with crop demand and eliminate any phosphorus overage). Higher

grass yields would demand additional phosphorus. Nitrogen from commercial fertilizer would be required at both 1,875 and 2,000 mature dairy cows.

It should be noted and planned that the *commercial* fertilization requirements to maintain high forage productivity and soil health can exceed the simple arithmetic difference between the nutrients applied by manure and the forage uptake. Rather, these values only represent the net amount of nutrients that need to be provided to and utilized by the crop through *commercial* fertilization, beyond the nutrient that is available to the crop from *manure* sources. Fertilization, especially the application of commercial nitrogen, can be inefficient with actual requirements with respect to forage production, and fertilization needs can be as much as 25 to 50 percent greater than the arithmetical difference resulting from a mass balance calculation - due to volatilization or soil sorption as mentioned above. Refer to the soils and agronomy analysis prepared by Russell Yost and Nicholas Krueger, University of Hawai'i at Mānoa College of Tropical Agriculture and Human Resources (CTAHR), EIS Appendix C.

Pond Siting, Lining and Water Resources

Refer to previous heading: Effluent Ponds, for additional information on pond capacity.

The pasture-based system utilizes manure as a valuable resource. This is a fundamental difference and advantage over conventional feedlot dairy operations, which have insufficient land to recycle the nutrients for uptake by forage plants and instead rely on imported feed and large storage lagoons to hold manure. The pasture-based dairy relies on 100 percent of the nutrients from manure deposited on the pasture, with application of manure captured in the effluent ponds, to grow the majority of forage for the herd.

Siting, design and construction of the ponds will be in compliance with the local land grant college guidelines and technical guidance from NRCS. Animal waste storage facilities should provide a minimum buffer of 1,000 feet from public drinking water resources, and 50-feet from surface water resources. The HDF facility sites the ponds approximately 125 feet from the nearest drainage ditch, and 3,420 feet from the nearest public drinking water well (see EIS Chapter 3, Section 3.3.2). Though the waterbody in which the County public wells occur is confined and hydrologically separated from shallow groundwater in the Māhā'ulepū Valley alluvial material, HDF agreed to establish a 1,000-foot setback surrounding the Kōloa F well with the County Department of Water. Within this setback, no effluent or commercial fertilizer will be applied, and no animals will be grazed.

Though not required by guidelines, HDF has elected to line the ponds to protect against seepage into surrounding soil. A synthetic liner will meet the standards of the NRCS Conservation Practice Code, and will be underlain with a sensor system that can detect moisture and alert personnel to potential leaks. Inlets, outlets, ramps and other elements of the effluent transfer system will be installed according to NRCS practices to prevent damage to the operation of the liner.

Air Quality

The HDF rotational-grazing pasture based system is fundamentally different than a conventional feedlot dairy. The rotational-grazing pasture based system utilizes 100 percent of manure on site as nutrients for forage crops. The effluent ponds differ from storage lagoons as effluent is cycled through on a regular basis and applied the fields, typically in conjunction with irrigation. Irrigation timing and amount is based on soil moisture and precipitation, but the typical application schedule is anticipated to be every 4 days. The liquid effluent utilized by either of the two irrigation pivots is well above the daily effluent generation from both the committed herd size and the contemplated herd size of up to 2,000 mature dairy cows (see EIS Appendix D, Section 8.4).

Manure in the effluent storage ponds have a short residence time and will not be covered. Therefore, HDF will not create a contained source of gases that could be released inadvertently.

No State or Federal regulations for greenhouse gas emissions from farm operations or small businesses currently exist. However, livestock and agriculture as an industry contributes to greenhouse gas emissions. During the public scoping period, inquiries about the project's potential contribution to greenhouse gas were received. As the dairy has not been established, published scientific models were applied to calculate probable emissions from the pasture-based dairy operations. Results are presented here, and the probable impacts assessed.

Estimates of GHG emission rates from a pasture-based dairy were calculated using the Intergovernmental Panel on Climate Change (IPCC) *Guidelines for National Greenhouse Gas Inventories*. Parameters for dairy cattle in Oceanic (warm) climates were selected as most applicable to conditions at HDF. Estimated emissions of methane and nitrous were converted to carbon dioxide equivalents (CO_2e) using the IPCC's AR3 global warming potential (GWP) that relates the GHG to CO_2.

Long-term operational impacts were modeled using the IPCC guidelines and conversions, and estimated the emissions potential for GHG at the dairy at the committed herd size of 699 milking cows to be 2,693 CO_2e metric tons per year (2,969 US tons). This is equivalent to the GHG generated by 170 4-person households, including home energy consumption, transportation and waste. For the contemplated herd size of up to 2,000 milking cows, the total GHG is estimated at 7,705 CO_2e metric tons per year (8,493 US tons). This is equivalent to the GHG generated by 485 4-person households, including home energy consumption, transportation and waste. See EIS Chapter 4, Sections 4.19.3 and 4.25.3, and the air quality report in Appendix I. GHG impacts from the HDF operation will be somewhat offset by additional carbon sequestration from the atmosphere (refer to Soils, previous). The potential net impact would not be significant and would not affect global climate change.

Operational practices to protect air quality by reducing nitrogen emissions will come from guidance in NRCS Conservation Practice Standard 590, Nutrient Management. Application of nutrients must be adjusted to minimize negative impacts of GHG release to the environment through adjustments to the source, timing, amounts, and placement of nutrients. Specific practices to be utilized at HDF include: slow release fertilizers; nutrient enhancement technologies; and stabilized nitrogen fertilizers.

Dust will be generated as cows move along soft limestone walkways that connect the paddocks and lead to and from the milking parlor. Potential emission rates were estimated from published literature, where particulate matter (PM) is measurable from the "drylots" of confined dairy operations where animals walk over dirt and dried manure throughout the day. Using emission rates from the published literature therefore greatly overestimates potential emission from HDF, as cows in a rotational-grazing pasture system will spend only two hours each day moving along cow walkways.

Using atmospheric dispersion modeling system (AERMOD), the rates were scaled to the size of the non-pasture areas used by cows at HDF. Results were added to the background concentration of particulate matter (both PM_{10} and $PM_{2.5}$) measured on the island of O'ahu. This was considered the total impact and was compared to the State ambient air quality standards. Only the contemplated herd size of up to 2,000 milking cows was modeled, as at the lower threshold of 699 cows the potential fugitive dust impact would be negligible.

The estimated concentration for PM_{10} is 2.01 $\mu g/m^3$ per 24-hour period, which is well below the State standard of 150 $\mu g/m^3$. The estimated concentration for $PM_{2.5}$ is 0.23 $\mu g/m^3$ per 24-hour period, which is well below the Federal standard of 35 $\mu g/m^3$.

The total annual particulate matter emissions were also estimated for PM and greenhouse gases (GHGs). Total annual emissions (in tons per year) are typically estimated for potential permitting applicability. Results of the estimate for a herd size of 699 mature dairy cows for PM was 0.6 tons per year, and 3.3 tons per year for a potential future contemplated herd size of up to 2,000 mature dairy cows. The project will not require any permits under the Clean Air Act, or State of Hawai'i counterpart.

Estimates of GHG emission rates from a pasture-based dairy were calculated using the 2006 Intergovernmental Panel on Climate Change (IPCC) Guidelines for National Greenhouse Gas Inventories. Parameters for Oceanic dairy cattle in warm climates were selected as most applicable to conditions at HDF. Long-term operational impacts were modeled using the IPCC guidelines and conversions, and estimated the emissions potential for GHG at the dairy at the committed herd size of 699 milking cows to be 2,693 CO2e metric tons per year. This is equivalent to the GHG generated by 170 4-person households, including home energy consumption, transportation and waste. For the contemplated herd size of up to

2,000 mature dairy cows, the estimated total was 7,702 CO2e metric tons per year (8,490 tons) is equivalent to the GHG generated by 485 4-person households, including home energy consumption, transportation and waste. EIS Sections 4.19 and 4.26 address the potential for greenhouse gas emissions by HDF.

While the presence of cows may increase GHG, a long-term beneficial impact of the grazing fields is the sequestration of carbon as CO_2 captured by the process of from photosynthesis by the grass. According to recent studies in the Soil Science Society of America Journal, converting formerly tilled cropland to grazed pasture can drive substantial accumulation of organic carbons in soil, which enhances soil quality, grass production, and has the potential to offset up to one-third the annual increase in CO_2 production of an area.

Threatened / Endangered Species

A botanical survey conducted for the EIS describes vegetation on the HDF site as typical of regularly disturbed land. The land has been under extensive cultivation for decades; no native plant habitats exist on site. Kikuyu grass was introduced to Hawai'i in 1925 and is one of the most important pasture and range grasses in the State. Cultivation of pasture grasses at the HDF site will not extend the range of introduced grasses in the area. Activities at HDF will not impact any areas dominated by native vegetation offsite, either upper elevation forests or coastal strand vegetation. The EIS Sections 4.9 and 4.10 address the evaluation of flora and fauna resources, with the technical report contained in Appendix A.

The botanical survey of the dairy property conducted in August 2014 by AECOS Consulting assessed existing plant species. The survey described that the present and historical uses of the area for intensive agriculture very much limit the natural botanical resources anticipated to occur. In all, 115 species of plants were identified within the surveyed area. Only five of these species (or 4.3 percent) are native to Hawai'i, and all of those are considered indigenous (found in Hawai'i and other Pacific Islands, as opposed to endemic species that are unique to the Hawaiian Islands). The remaining 110 species identified are introduced plants that have become naturalized, with the exception of one introduced plant that is regarded as an ornamental plant. Complete species lists are included in the EIS, and no rare or protected botanical species, or intact native plant communities, occur on the project site. No long-term impacts to native plant habitats or endangered or threatened plants species will occur as a result of the dairy.

Avian and mammalian surveys were conducted in August 2014 by Rana Biological Consulting, Inc. The survey was conducted to assess the potential presence of avian or mammalian species currently listed as endangered, threatened or proposed for listing under either Federal or the State endangered species lists. The survey covered the dairy site area and immediate vicinity. Common birds and terrestrial mammals were encountered on the property. There is no critical habitat for endangered species in the upper Māhā'ulepū Valley.

Four species of endangered waterbirds were recorded on the site and at the nearby taro farm located within the HDF site, though the area does not provide critical habitat. Nēnē, the native Hawaiian goose, was also seen on the site, and DOFAW biologists have noted they are regularly seen on the subject property. It is probable that some nest on or adjacent to the site as this species nests in the general Kōloa area, and the habitat present on parts of the site is suitable for nēnē nesting.

The principal potential impacts posed to these four waterbird species include those potentially associated with construction activities, and those associated with dairy farm operations following build-out. Measures will be adopted to avoid potential seabird and nēnē goose collisions with fences and structures. Potential measures include lowering construction cranes at night, using conservation fencing to project specified areas, marking tall structures and fencing with white visibility polytape, limiting nighttime lighting, and shading any outside lights used at night. Ongoing mitigation strategies will be implemented for day to day preventative measures, including an Avian Species Protection Plan. Mitigation measures are further described in DEIS Section 4.10.2.

It is also likely that Hawaiian hoary bats overfly the project area on a seasonal basis. While caution will be taken during any potential disturbance or vegetation removal, there are almost no suitable roost trees within the dairy site, thus it is not expected that the dairy farm will not affect this listed mammalian species.

A study of invertebrate species and pest insects was conducted in January 2016 by Steven Lee Montgomery, PhD, Consulting Biologist. There are no known caves or lava tubes found at or adjacent to the dairy farm property. The Kōloa Lava Tube System, which provides habitat for two endemic cave species, the Kaua'i Cave Wolf Spider and the Kaua'i Cave amphipod, is located several miles away from the dairy farm property. Both invertebrates are listed as endangered under the U.S. Endangered Species Act. Not all caves in the Kōloa area contain these invertebrates, as most caves in the Kōloa District do not contain the optimal climatological conditions required by these organisms. Neither the botanical and faunal survey nor the invertebrate survey revealed any evidence of lava tubes or caves on the property, and no such features have been reported for the area in the near surrounds of the HDF site. Thus no cave invertebrate species will be affected by the dairy farm.

II. Economic and Social Welfare

The Hawai'i Dairy Farms project is subject to an historic preservation review by the State Department of Land and Natural Resources, State Historic Preservation Division (SHPD) under HRS Chapter 6E and Chapter 13-284. An Archaeological Inventory Survey (AIS) and a Cultural Impact Assessment (CIA) were conducted by Scientific Consultant Services (SCS) for the proposed project.

The archaeological survey included an area to 1,000 meters north of the HDF site northern boundary, at the request of SHPD. Ten sites of the total 16 identified occur in the extended survey area. The 6 sites identified within the project area

consist of historic-era bridges, ditches, culverts, retaining walls, and a flume system dating from the 20th century, all of which are affiliated with sugarcane cultivation. The sites within the project area associated with Plantation-era sugarcane cultivation will not be adversely affected by the proposed project. Most are in fair to good condition, and will likely be adaptive for re-use, such as bridges and culverts. The project will be fully enclosed by perimeter fencing along the boundary of the leased premises, which will ensure that project activities and any related impacts are contained within the project area. No long-term impacts are anticipated, and no further mitigation is recommended for the project area.

The cultural assessment examined the potential effect of the project on cultural resources, practices or beliefs, its potential to isolate cultural resources, practices or beliefs from their setting, and the potential of the project to introduce elements which may alter the setting in which cultural practices take place. Information received from the community indicates the Māhā'ulepū Ahupua'a, has been and is currently used for traditional cultural purposes. However, the dairy project area has not been included in these activities. It is clear that the gathered plants, trails, State Site 50-30-10-2250, the agricultural heiau, and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area.

Based on the research and comments received from the community, it is reasonable to conclude that, pursuant to Act 50, the exercise of native Hawaiian rights or any ethnic group related to numerous traditional cultural practices will not be adversely impacted by establishment of the dairy.

<u>Social Impacts</u>

The potential impacts of Hawai'i Dairy Farms to the existing economy were evaluated in the EIS, including a fiscal impact assessment report completed in April, 2016 by Plasch Economics Pacific. EIS Section 4.15 addresses demographic and economic factors, with the complete report in Appendix J.

The Hawai'i Dairy Farms project would create short-term benefits through jobs for local construction personnel and local material suppliers. Construction employment would be expected to average about 12 jobs per year during the development period. Such jobs would include equipment operators, cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, supervisors, painters, etc. Based on State employment multipliers, indirect employment related to Dairy construction would be expected to average about 16 jobs on Kaua'i, and 8 on O'ahu. Thus direct-plus-indirect employment association with Dairy development would be expected to average approximately 36 jobs, of which 28 would be on Kaua'i.

Hawai'i Dairy Farms would contribute to diversification of Kaua'i's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Big Island), less than 10 percent of Hawai'i's milk is locally supplied. Hawai'i Dairy Farms, with an established herd of up to 699 milking cows, will increase the supply of local fluid milk by approximately 1.5 million

gallons of milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and indirect full-time equivalent jobs on Kaua'i, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs would be created on O'ahu.

Construction of the facilities at HDF would contribute approximately $9.1 million per year during the development phase. This includes direct equipment and construction expenditures, and indirect sales related to construction. Once fully operational with a herd of 699 mature dairy cows, annual direct-plus-indirect sales are estimated annually at $8.1 million on Kaua'i, with an additional $2 million on O'ahu.

Economic impacts of nuisance issues that could affect property values were examined. With a long history of agriculture, most of Kaua'i has a rural ambiance. Most homes and visitor units on the island are within one mile of some agricultural activity; the rural character adds to the appeal of the island. The site of the Grand Hyatt Kaua'i was rezoned from agriculture to resort; the resort opened in 1992 while sugarcane was still grown just mauka of the hotel property.

Sugarcane fields bordered Kōloa on three sides, and bordered parts of Po'ipū. Sugarcane fields were burned prior to harvest, creating smoke; dust and soil runoff followed field disturbance; and large canehaul trucks created considerable noise, dust and cane litter. The Kōloa Sugar Mill emitted odors, smoke and noise. The distance of the mill to the nearest homes in Kōloa is approximately 0.8 mile; proposed dairy activities would be 2.5 miles from the nearest home in Kōloa. An agricultural transition to seed crops utilized land adjacent to the Po'ipū Bay Resort Golf Course. Dust from disturbed, open lands was an issue, and concern of herbicide use drifting offsite dominated community conversations. Dust from proposed HDF operations would be minimal with grass as the cover crop.

With the demise of sugar and seed crops in Kōloa and Po'ipū, the cattle grazing for the beef market is now the dominant use of agricultural land in the region. Grazing lands to the east, north and west of Kōloa total over 2,900 acres, which is reduced from over 3,300 acres before Māhā'ulepū Valley was leased by HDF. In the near term, grazing is likely to expand onto most of the lands used recently for seed crops. In Kōloa and Po'ipū, grazing occurs less than 200 feet from some homes, less than 1 mile from some visitor units, less than one-third of mile to the east and west of the main commercial area of Kōloa, and less than 200 feet from a golf course.

Many of the homes in the region that are near cattle operations are in the northeast and eastern sections of Kōloa; most of the homes were built before 1980 and are of modest size (less than 1,200 square feet). For these homes, the 2016 median assessed values ranged from $406,100 to $567,500. At the western end of Po'ipū is Kukui'ula—a luxury residential community that abuts grazing land. Most of the homes are newer, built after 2012, and most are large at over 2,100 square feet. For 2016, median assessed values of these residential lots and homes ranged from

$1,297,150 for a lot, to $2,893,100 for a lot with home. Clearly, beef cattle operations are compatible with nearby homes, commercial areas, resorts and recreational areas. Although stocking densities are lower for beef cattle on unirrigated pastures than they are for the proposed dairy on irrigated pastures, the operations are similar: cattle are rotated among pastures as limited by the carrying capacity of the land.

Results of technical studies and the findings of the EIS show no unmitigated nuisances that would affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will reach resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area. The dairy will help maintain the existing rural character and ambience of the Kōloa-Po'ipū region.

Noise

Existing noise conditions of the project site and surrounding Māhā'ulepū Valley area are evaluated in the EIS, along with anticipated short-term and long-term noise conditions associated with the dairy farm and planned mitigation actions. EIS Section 4.12 addresses noise conditions.

Noise can be defined as unwanted sound, a sound that is considered loud or unpleasant, and/or sound that causes disturbance. Research related to noise and livestock focuses on noise levels and minimization of unexpected sounds that stress caused to cows. Noise stress results in loss of livestock productivity and thereby financial loss to farmers and ranchers. Little research exists on the sound levels from livestock.

Sound is measured in decibels (dB). The State of Hawai'i Department of Health rules use the A-weighting sound network (dBA) in the HAR §11-46, Community Noise Control. Sound through the air is similar to ripples on a pond of water. In open space without reflection, ripples spread uniformly in all directions and decrease in amplitude further from the source. In free field conditions such as outdoors, amplitude drops by half as distance doubles, which is a drop of 6 dBA (OSHA, 2016). When sound passes close to absorbing ground cover such as grassland and fields, the "soft ground" absorbs extra sound as it passes. The HDF site in Māhā'ulepū Valley is 2.5 miles from the resort area, and 1.5 miles from the closest residential areas (on land zoned for agriculture). Typical noise currently generated near the HDF site includes truck ingress/egress along private farm roads, agricultural equipment, and cattle and sheep.

The dairy farm will utilize milking equipment contained in the milking parlor, and will use field equipment such as tractors. Under HAR §11-46, agriculture is classified as Zoning District Class C, which specifies maximum permissible sound levels of 70 dBA in the daytime and 70 dBA at nighttime. Dairy operations will generate noise in keeping with agricultural zoning of the parcel. The primary noise receptors in the area would be farmers working nearby parcels. Noise from the

dairy will not exceed the DOH threshold, and will not contribute to excessive noise in the region.

Traffic

The EIS Section 4.18 and 4.25 includes an evaluation of roadways and traffic conditions, along with potential impacts of the Dairy Farm construction and operation. Primary access to the site is via Māhā'ulepū Road, a two-way two-lane road, which is accessible from Kōloa Road (Highway 530) via Ala Kinoiki Road. Within the project area, there is a network of unimproved private agriculture haul roads that provide access to and from Māhā'ulepū Road.

Traffic operations along Māhā'ulepū Road and the surrounding County roads are expected to continue to operate at acceptable levels of service during peak hours of traffic. The projected increase in vehicle movements related to HDF operations at is shown in EIS Sections 4.17 and 4.24. Daily employees accessing the site, milk tanker and supply trucks, and a pick-up truck with stock trailer will increase vehicle trips by a total of 12 per day for the committed herd size, and by 23 vehicle trips per day with the contemplated herd size. These additional trips represent less than 1 percent of total vehicle movement in the area. HDF would have a minimal effect on traffic conditions at County roadways in the surrounding area.

Recreation

The State Department of Health Clean Water Branch noted in its Sanitary Survey prepared for the watershed that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The predicted risk of illness from recreation exposure to a cattle-impacted waterbody is 25- to 150-times lower than the risk of illness associated with human sources of contamination.

As stated previously in reference to surface water runoff and nearshore marine impacts, long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team regarding changes in water quality. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kaua'i community.

Infrastructure Concerns

Construction of the dairy facilities would require temporary power demands similar to any small-scale development on Kaua'i. A request for power would be submitted to the utility. Power for construction could be supplemented with onsite gas-powered generators for use of typical construction power tools. The pasture-based dairy system allows cows to remain in the field for 22 hours of each day and does not require the energy-intensive cooling systems utilized by a conventional confined feedlot dairy (see Chapter 6, Section6.4). No significant electrical demand will be required by HDF.

III. Public Health Concerns

As stated previously regarding water quality, no impacts are anticipated to the aquifer deep in the unweathered volcanics, which is the source of potable water. The shallow level groundwater in the alluvial material on the valley floor is hydrologically separated from the deep aquifer.

A long-term water quality monitoring program will be instituted to regularly sample and analyze nutrient levels the surface waters (agricultural ditches and Waiopili Ditch). The monitoring program and methods will be established to meet the CWB quality assurance/quality control requirements.

As stated previously in reference to air quality, particulate matter (PM) emissions modeled from HDF operations do not exceed State standards. Equipment utilizing petroleum fuels will consist of standard farm vehicles: tractor/mower; pick-up truck; and a small utility vehicle. Milk tanker trucks are anticipated once every two days for the committed herd size, and twice daily at the contemplated herd size.

In waste treatment, the primary functions of soil are to prevent migration of pathogens to surface water or groundwater, retard and reduce contaminants, and provide a barrier against direct human contact with effluent. A study prepared for the State of Hawai'i Department of Health (DOH), Safe Drinking Water Branch identified groundwater zones most at risk from on-site disposal systems by evaluating – among other parameters - soil filtering capacity. The study mapped soil hydraulic conductivity state-wide. For adequate treatment to occur, the soil must be permeable enough to prevent saturated conditions, but also have a small enough pore throat diameter to filter pathogens from the effluent. Clay particles act as sorption sites for nitrate and other nutrients. Bacteria in soils can convert reactive nitrogen species into inert nitrogen gas.

Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. The hydraulic conductivity of permeable flank lavas in the Hawaiian Islands ranges from hundreds to thousands of feet per day, whereas estimates for less permeable dike-intruded lavas range from 1 to 500 feet per day. The EIS Chapter 4, Figure 4.3-2 depicts the hydraulic conductivity for the south Kaua'i area. Permeable lavas, represented by a high hydraulic conductivity, increase the distance groundwater can travel before pathogens die-off or contaminants can degrade to a point of being benign. The weathered alluvium of Māhā'ulepū Valley shows a hydraulic conductivity on the order of 10.5 – 50 feet per day, whereas the adjacent soils of the Kōloa-Po'ipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area, allowing greater time for the remedial properties of soil and associated bacteria to denitrify nitrates and render potential contaminants inert.

Nuisance Pests

Integrated pest management utilizes knowledge of the ancient food web among species. Disrupting reproduction of potential pests with appropriate means at key points in the life cycle has been used in Hawai'i for decades. Extensive introduction of dung beetle species between 1898 and 1985 in response to cattle-related insect pests resulted in 14 dung beetle species becoming established on Kaua'i. Cattle egrets, a bird species introduced to Hawai'i in the late 1950s to control cattle-associated insects, break up dung patties while searching for prey. Dung beetles speed incorporation of the manure into the soil by breaking up bovine manure pats and transporting the organic material into the soil. A healthy population of dung beetles can bury a dung pat in one to three days.

Long-term management for pests relies on a natural food web cycle that will expand as the habitat (manure) is increased. Breaking up and burying the dung patty destroys the habitat for insects such as flies to complete their life cycle. The stable fly requires approximately 21 days within the dung patty for the immature life stage (egg to pupa) to survive. The house fly takes 7 to 10 days from egg to fly, and can use a number of damp, decaying material as habitat. The horn fly takes 10 to 20 days from egg to adult. Research shows that 95 percent fewer horn flies emerged from dung patties containing a beetle species that has been identified at the HDF site.

In the short-term, supplemental pest control using mechanical and chemical methods may be used to prevent any spike in pest populations. Mechanical methods include sticky tapes or ribbons that could be used in the milking parlor or covered areas of the dairy facility. Traps will be used as needed for both monitoring and removal of flies. Traps can use attractants or not; versions designed for use outdoors could be used in paddocks from which cows are excluded (those not being actively grazed). Chemical methods may be used to prevent short-term spikes in pest populations. Insecticides and herbicides are non-discriminatory and kill beneficial as well as pest insects. Such control would only be used when needed by those qualified to apply chemicals, and in accordance with authorized procedures and regulatory labeling requirements.

Supplemental grain for cows is stored in above-ground silos and fed in troughs within the milking parlor. Best management practices to be used at HDF include sweeping up of any spilled feed; such practices will minimize attractants for rats. Rodents and other pests have the potential to impact dairy operations and will not be tolerated.

A licensed veterinarian may prescribe use of antibiotics approved by the Food & Drug Administration (FDA) for treatment of illnesses. Adherence to guidelines that prohibit milk from cows undergoing antibiotic treatment will ensure no adulteration of milk. HDF will not inject cows with bovine growth hormone, referred to as rBST or rBGH. 100 percent of the manure produced on site will be applied to the pasture grass and will not be stored in lagoons like a conventional feedlot dairy.

HDF will comply with the applicable State and Federal regulations related to the importation of livestock and livestock disease control. This includes importation requirements by the State of Hawai'i Animal Industry Division pre-entry requirements such as testing for diseases such as brucellosis, and tuberculosis. The cows will also undergo approved external parasite prevention methods, and national uniform tagging or identification registration and processing.

A study of invertebrate species and pest insects was conducted by Steven Lee Montgomery, PhD, Consulting Biologist in January 2016. The study summarizes the presence or absence of native species or pest species associated with cattle manure in the general Māhā'ulepū area, as well as the parasites and predators that control those species. No federally or state listed endangered or threatened invertebrate species were noted in the survey of the site. A full report and list of species found on site is provided in EIS Section 4.11 and Appendix B.

Flies were identified on the HDF site using manure from neighboring livestock as bait for invertebrates. The two flies associated with livestock are the stable fly and the horn fly, the latter known for biting cattle. These flies and the greenbottle fly are often confused with the house fly. HDF will prevent and control fly population growth through diligent clean up and sanitation practices regarding any trash and food waste, as well as through efficient manure composting practices. A full list of site management measures is provided in EIS Section 4.11.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Conclusion

The proposed dairy farm will achieve the objective of increasing current local milk production and bolstering Hawai'i's declining dairy industry while reducing reliance on imported milk from the mainland United States. The rotational-grazing pasture dairy system will utilize manure on-site as fertilizer to grow grass, reducing imported fertilizer and feed, and minimizing potential impacts to the environment. The dairy farm will comply with all applicable federal, state, and county policies in plans in regards to land use, environmental protection measures, and other associated regulatory controls.

Your letter and this reply will become part of the public record and be appended to the Draft EIS. This response letter accompanies your copy of the Draft EIS. Should you prefer an electronic copy of the Draft EIS, it can be found on the OEQC website: http://tinyurl.com/OEQCKAUAI. Search "Hawai'i Dairy Farms" to find the published Draft EIS.

Thank you for your participation in the environmental review process.

Sincerely,
GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

cc: Hawai'i Dairy Farms
Hawai'i State Department of Health,
Environmental Planning Office

INDIVIDUALS

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February 22, 2015
Via Certified Mail, Return Receipt Requested:

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Also via e-mail to:
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Dear Ms. McIntyre,

I hereby exercise my right to submit comments concerning Hawai'i Dairy Farm's (HDF's) environmental impact statement preparation notice, dated January, 2015. I wish to be a consultant on the draft EIS and I wish to be kept informed by mail and/or email.

It is increasingly clear to me that, based on the data currently available, the construction and operation of a 2,000-head dairy farm on Kaua'i's south shore will cause irreparable environmental, economic, and social harm.

I am a resident of Poipu. As such, I live downwind from the proposed Hawaii Dairy farm. I wish to register my strong opposition to establishment of the dairy farm at the proposed site for the following reasons.

1. I believe the proposed dairy would contaminate the air, sending harmful airborne pathogens and other air pollutants downwind. I am a medical doctor and am quite concerned about this issue. I would like the Environmental Impact process to take into account the following information and medical concerns. Animal feeding operations (AFOs) are animal farming operations, such as dairy farms, where dairy cows and other livestock are managed. AFOs generate volatile organic compounds (VOCs), that is, organic gasses that react with the atmosphere to create pollution. In its August 15, 2001, report "Emissions From Animal Feeding Operations", posted on www.epa.gov, the EPA provided the following information:

"Animal feeding operations can emit ammonia, nitrous oxide, hydrogen sulfide, carbon dioxide, VOCs, hazardous air pollutants, and particulate matter. These emissions can have a variety of harmful health effects. VOCs also contribute to the formation of atmospheric ozone which is a respiratory irritant. Some VOCs are designated in the Clean Air Act as hazardous air pollutants".

Beyond my concerns about the health hazards of the dairy farm at the proposed site, I am also concerned about the anticipated "rotten eggs" odor that will appear in the air as a consequence of the released of hydrogen sulfide from the cows burps, farts, and manure.

2. I believe the proposed dairy would put at risk the survival of several endangered species. The Hawaii Dairy Farm claims to be effluent-free, but they have not demonstrated that they have adequately taken into account the actual reality of rainfall on Kauai. Several years ago there was an episode of rain on Kauai that persisted for forty days and forty nights without stop. One consequence of this exceptionally heavy rain event is that one of Kauai's water reservoirs overflowed, sending tons of water hurtling downhill and killing seven people. Now that we know that such a thing can happen on Kauai, the EIS for Hawaii Dairy Farm should prove beyond doubt that it can handle such an event. Of course, in addition to the 40 days' rain that so devastated the island, Kauai is subject to hurricanes. Such weather events would overwhelm any catchment basins for treating cow manure and urine that HDF is planning to construct. The results would be run-off of polluting substances into the near-by ocean and along the coastline, endangering the survival of marine wildlife protected by the Endangered Species Act.

HDF bills itself as a zero discharge operation but must prove that claim before it starts operation, including any construction activities. After conducting an intensive groundwater monitoring and modeling study, HDF may determine that is simply not feasible to put any type of manure storage lagoon in this area. It may decide either to abandon the project for a dairy farm altogether or to move it to a medically and environmentally safer location.

Sincerely,

Martin Albert, MD

GROUP 70 INTERNATIONAL

May 26, 2016

Martin Albert M.D.
2330 Ho'ohu Road
Koloa, HI 96756
malbert@bu.edu

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Martin Albert:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

DAIRY OPERATIONS: Hawai'i Dairy Farms (HDF) will establish and operate a sustainable, pastoral rotational-grazing dairy farm in Māhā'ulepū Valley on the island of Kaua'i to produce fresh, locally available nutritious milk for Hawai'i families. The rotational-grazing method utilizes 100 percent of the cows' manure as natural fertilizer to grow pasture grass as a primary source of nutrition for dairy cows. This cost-effective method will reduce reliance on imported fertilizer and feed. Pasture grass will comprise at least 70 percent of the animals' diet. As a part of the Draft Environmental Impact Statement (EIS), the proposed facilities and operations for the dairy farm are described in Chapter 3.

The Environmental Impact Statement (EIS) Preparation Notice (EISPN), published January 23, 2015, described the proposed pasture-based rotational grazing system

as a "zero-discharge, grass-fed dairy". The term "zero-discharge" under the U.S. Environmental Protection Agency related to concentrated feeding operations (CAFO) is a system designed to not discharge pollutants into waters of the United States. As noted previously, the HDF system is designed to utilize 100 percent of the cows' manure on-site. However, nutrients would be introduced to the HDF site with any use; the Draft EIS identifies the amount of nutrients anticipated from the proposed dairy operations that could pass through to ground and surface waters. Therefore, HDF elected to discontinue use of the term "zero discharge" as it was construed as no nutrients into the system.

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The effluent storage ponds are sized to accommodate 30 days of storage for up to 2,000 mature dairy cows, and over 85 days of storage for 699 mature dairy cows. It will be highly unlikely that the storage pond will be full at any time for the contemplated 2,000-cow dairy, and nearly impossible for the committed 699-cow dairy. Throughout the less than 30-day storage period, effluent is planned for application every four days, and the slurry application is expected at least once every 45 days, to ensure that the ponds are kept at manageable levels.

Cows lactate milk following the birth of calves. Newborn calves will be housed on the Māhāʻulepū site and provided essential colostrum and nutrients for a healthy start. During the calves' initial 90 days, they will be transitioned to pasture at HDF before transfer to ranches on Kauaʻi to be raised off-site. The committed herd size of

699 mature dairy cows at the Māhāʻulepū site applies to mature mature dairy cows. Animals in various stages of lactation and rest will be transferred between HDF and other partner ranches as needed for animal health and dairy productivity. This will benefit both the dairy and infuse the beef market in Hawaiʻi with a new, local source of pasture-raised calves. Male calves will become part of the beef cattle herd; heifers (young female calves that haven't given birth) will be raised until ready to return to the HDF herd as a birthing/mature dairy cow. For more information on off-site herd management, refer to Section 3.7 of the Draft EIS.

Health of the herd is of primary importance as the success of a dairy relies on cows effectively producing quality milk. All cows will be treated with a high standard of care. Dairy managers and caretakers will be trained and competent in handling animals to minimize stress and ensure the herds' welfare. A licensed veterinarian may prescribe use of antibiotics approved by the Food & Drug Administration (FDA) for treatment of illnesses. Adherence to guidelines that prohibit milk from cows undergoing antibiotic treatment will ensure no adulteration of milk. Routine laboratory tests of milk for traces of antibiotic residue will be conducted. HDF will not inject cows with bovine growth hormone, referred to as rBST or rBGH.

FLORA AND FAUNA: Botanical, avian, and mammalian surveys of the property were conducted for the Draft Environmental Impact Statement (EIS) to assess existing species on site, including identifying any species listed as endangered, threatened, or proposed under any state or federal endangered species programs in or near the property. EIS Sections 4.9 and 4.10 address the evaluation of flora and fauna resources, with technical studies in Appendix A and B.

A botanical survey of the dairy property was conducted in August 2014 by AECOS Consulting to assess existing plant species. The survey also investigated for the presence of plants currently listed as endangered, threatened or proposed for listing under Federal or the State of Hawaiʻi's endangered species programs, located onsite or within the immediate vicinity of the dairy site. The nature of the land and its present and historical uses for intensive agriculture very much limit the natural botanical resources anticipated to occur on this land. Complete species lists are included in the EIS, and no protected botanical species occur on the project property. The project will include vegetated buffer strips along the drainage ways as part of the Conservation Plan to reduce erosion and stabilize slopes. Where native plants occur or could survive if planted, native plants will be used in the stabilization. No long-term impacts to native plant habitats or endangered or threatened plants species will occur as a result of the dairy.

Avian and mammalian surveys were conducted in August 2014 by Rana Biological Consulting, Inc. This survey was conducted to assess the potential presence of avian or mammalian species currently listed as endangered, threatened or proposed for listing under either Federal or the State endangered species lists. The survey covered the dairy site area and immediate vicinity. Common birds and terrestrial mammals were encountered on the property. There is no critical habitat for endangered species in the upper Māhāʻulepū Valley.

Four species of endangered waterbirds were recorded on the site and at the nearby taro farm located within the HDF site. Though the area does not provide critical habitat, seabirds that nest in upland areas of Kauai may overfly the site. The endangered Hawaiian goose, nēnē was also seen on the site. State Division of Forestry and Wildlife biologists have noted nēnē are regularly seen on the subject property. It is probable that some nest on or adjacent to the site as this species nests in the general Kōloa area, and the habitat present on parts of the site is suitable for nēnē nesting.

The principal potential impacts posed to the five endangered species include those potentially associated with construction activities, and those associated with dairy farm operations following build-out. Measures will be adopted to avoid potential seabird and nēnē goose collisions with fences and structures. Potential measures include lowering construction cranes at night, using conservation fencing to project-specified areas, marking tall structures and fencing with white visibility polytape, limiting nighttime lighting, and shading any outside lights used at night. Ongoing mitigation strategies will be implemented for day-to-day preventative measures, including an Avian Species Protection Plan. Mitigation measures are further described in DEIS Section 4.10.2.

It is also likely that Hawaiian hoary bats overfly the project area on a seasonal basis. While caution will be taken during any potential disturbance or vegetation removal, there are almost no suitable roost trees within the dairy site, thus it is expected that the dairy farm will not affect this listed mammalian species.

AIR QUALITY: As a part of the Environmental Impact Statement (EIS), existing air quality conditions and project impacts were evaluated, including dust and odor. Potential odors and emission levels for air pollutants relevant to dairy operations were modeled, as currently there are no cows on site. EIS sections 4.19 and 4.25 provide an evaluation of air quality and odors, including a windrose depicting wind speed and direction in the area (see DEIS Section 4.1, Climate). The full air quality technical report can be found in Draft EIS Appendix I.

Clean Air Act

Under the *Clean Air Act of 1970* (CAA), amended November 1990, the U.S. Environmental Protection Agency (EPA) regulates both large and small sources of air pollutants by establishing National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. The State of Hawaiʻi has established its own *State Ambient Air Quality Standards* (SAAQS) that are as strict or, in some cases more strict than the NAAQS. State standards prohibit any visible emissions of fugitive dust from construction activities at the property line.

Emissions relevant to livestock operation include particulate matter and fugitive dust. Greenhouse gases related to dairy cows include methane (CH_4) from enteric fermentation, and both methane and nitrous oxide (N_20) emissions from manure application. No State or Federal regulations for greenhouse gas emissions from farm operations or small businesses currently exist.

DUST

Dust will be generated as cows move along soft limestone walkways that connect the paddocks and lead to and from the milking parlor. Potential fugitive dust emission rates were estimated from published literature, where particulate matter (PM) is measurable from the "drylots" of confined dairy operations where animals walk over dirt and dried manure throughout the day.

Applying the emission rates from this available literature greatly overestimates potential emission resulting from HDF. Cows in the pastoral rotational-grazing system will be on pasture 22 hours each day and will spend two hours – in two separate milking cycles –moving to and from the barn for the 10- to 15-minute milking sessions.

Using atmospheric dispersion modeling system (AERMOD), the rates were scaled to the size of the non-pasture areas used by cows at HDF. Results were added to the background concentration of particulate matter (both PM_{10} and $PM_{2.5}$) measured on the island of Kaua'i, and the total concentration was compared to the State ambient air quality standards. Only the contemplated herd size of up to 2,000 milking cows was modeled, as at the lower threshold of 699 cows, the potential fugitive dust impact would be negligible. The estimated concentration for PM_{10} is 2.01 $\mu g/m^3$, well below the State standard of 150 $\mu g/m^3$. The estimated concentration for $PM_{2.5}$ is 0.23 $\mu g/m^3$, well below the Federal standard of 35 $\mu g/m^3$ (see Draft EIS Section 4.19 and Table 4-19.2).

ODOR

Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF, so air dispersion models were used to determine potential odor levels. Local weather data was used in conjunction with the AERMOD modeling system, and published rates for manure odors emissions for dairy heifers and effluent ponds were adapted to reflect the HDF facilities.

Odor emission sources identified for modeling at HDF were manure in the pasture fields, irrigation water containing diluted nutrients from effluent, the effluent storage ponds, and the dairy buildings. Odor rates from published research were applied. Odor isopleths (a line used to map all points having the same numerical value) were created to display the model findings. Odor is described in "odor units" at the threshold of perception, which is defined by the point at which 50 percent of panelists, in laboratory conditions, cannot smell the odor but 50 percent of the panelists can detect the odor.

Modeling results were generated for worst case meteorological conditions (low wind velocity / mixing). Generally, tradewinds will disperse odors to less than detectable levels beyond the HDF site; in periods of no wind, odor may not be dispersed creating the "worst case" scenario. In these periods without normal tradewind flow, the odor plume would extend to the south of the HDF site. Sections 4.19.2 and 4.25.2 of the EIS include graphics of the potential odor isopleths.

Results for the committed herd size of 699 milking cows show that odors may be detectable by 50 percent of the sensitive population once per 200 hours, or 44 hours per year, within an area that extends approximately 1,670-feet (within one-third of a mile) beyond the dairy farm boundary, and does not reach recreational or residential areas. Results for the contemplated expanded herd size of up to 2,000 milking cows show odors would not extend beyond 2,780 feet outside the HDF boundary (just over half a mile), again not reaching recreational or residential areas, and again with detection limited to 50 percent of the sensitive population approximately 44 hours per year. The parameters used in the analysis were intentionally conservative, and the impacts shown assume an unlikely confluence of worst-case meteorological data, irrigation location, and grazing location. Actual offsite odor impacts are likely to be much lower and/or less frequent than shown; it is likely odor detection beyond the HDF boundaries will be less frequent.

GREENHOUSE GASSES: Draft Environmental Impact Statement (EIS) Sections 4.19 and 4.26 address the potential for greenhouse gas emissions by Hawai'i Dairy Farms (HDF). Estimates of GHG emission rates from a pasture-based dairy, including methane and nitrous oxide, were calculated using the 2006 Intergovernmental Panel on Climate Change (IPCC) Guidelines for National Greenhouse Gas Inventories. Parameters for Oceanic dairy cattle in warm climates were selected as most applicable to conditions at HDF. Long-term operational impacts were modeled using the IPCC guidelines and conversions, and estimated the emissions potential for GHG at the dairy at the committed herd size of 699 milking cows to be 2,693 CO_2e metric tons per year. This equates to roughly 1.02 percent of the utility power generation sector on Kaua'i in 2013, which does not include vehicle emissions and other GHG emitters on the island.

Potential GHG emissions for HDF at the contemplated herd size of up to 2,000 milking cows was modeled as described in Section 4.19.3 using the IPCC guidelines and conversions. The estimated total of 7,702 CO_2e metric tons per year (8,490 tons) is 5,009 CO_2e metric tons (5,521 tons) greater than the committed herd size of 699 milking cows. This equates to an increase equivalent to 1.91 percent of GHG produced on Kaua'i for power generation by the utility in 2013 (KIUC, 2014). Power generation does not include vehicle emissions and other GHG emitters on the island.

While the presence of cows may increase GHG, a long-term beneficial impact of the grazing fields is the sequestration of carbon as CO_2 captured by the process of photosynthesis by the grass. According to recent studies in the Soil Science Society of America Journal, converting formerly tilled cropland to grazed pasture can drive substantial accumulation of organic carbons in soil, which enhances soil quality, grass production, and has the potential to offset up to one-third the annual increase in CO_2 production of an area.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

Phyllis Albert
Poipu Crater Unit 2
2330 Ho'ohu Road
Koloa, HI 96756
phyllisalbert@gmail.com

February 23, 2015
Via Certified Mail, Return Receipt Requested:

Laura McIntyre
State of Hawai'i
Department of Health
1250 Punchbowl Street
Honolulu, HI 96813

Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, HI 96813

Jeff Overton
Hawai'i Dairy Farms, LLC
PO Box 1690
Koloa, HI 96756-1690

Also via e-mail to:
HDF@Group70int.com
laura.mcintyre@doh.hawaii.gov

Dear Ms. McIntyre,

I hereby exercise my right to submit comments concerning Hawai'i Dairy Farm's (HDF's) environmental impact statement preparation notice, dated January, 2015. I wish to be a consultant on the draft EIS, and I wish to be kept informed by mail and/or email.

It is increasingly clear to me that, based on the data currently available the construction and operation of a 2,000-head dairy farm on Kaua'i's south shore will cause irreparable environmental, economic, and social harm.

Although I have multiple concerns about all these harms that will be caused, I will limit my discussion here to requesting adequate response to issues regarding the protection of our waters and endangered species.

We of the neighboring community need to be given evidence that HDF has made no operational decision prior to researching and accommodating to the various local, state, and federal ordinances, statutes, and regulations that may impose additional requirements on its proposed dairy operations, including Hawai'i Constitution, Clean Air Act, Clean Water Act, and the Endangered Species Act.

Although HDF made it clear that is aware of at least four native bird species that are listed by both federal and state they have failed to address the requirement to conform to this Act.

My comments are based on the fact that HDF's Waste Management Plan ("WMP") clearly indicates that this facility is being designed from the ground-up to handle 2,000 head and therefore 2,000 head should be the number that is evaluated throughout this EIS process, not the deceptively low 699 figure used by HDF in its paperwork. The deceptive practices of HDF are clear in the fact that they deliberately picked the number 699 to avoid being labeled a large dairy animal operation, and therefore subject to more restrictive federal laws. The definition of large begins with 700. This pure deception must be understood, revealed and reacted to with great attention to their lack of concern for the people and the environment.

Studies have indicated that a dairy that has 700 mature dairy cows housed on site produces similar waste load as a city of 411,000 people. This means that HDF's 2,000 dairy cows will produce, on average, the same amount of waste generated by a human population of 328,800.

HDF's proposed dairy would create five times more waste than the entire human population of Kaua'i. Unlike human waste, however, which is required to be treated, HDF will dump the waste created by its herd directly onto the 517 acres of land it has secured for grazing.

The pollution that originates from HDF's proposed facility will include contamination of surface waters that eventually discharge into the ocean. The natural watercourses and man-made ditches traversing the proposed HDF site should properly be construed as "Waters of the State," as well as "Waters of the United States," protected by water quality standards.

The area where the discharges will occur has been designated as Class 1 critical habitat by the State.

Although there are two identified wetlands on the site, each of which receives runoff and likely groundwater originating from the pastures, HDF has not offered an analysis of how manure-contaminated water will impact the coastline, the critical habitat designations, or the Class 2 inland water that leads to the Class A marine waters along the Māhā'ulepu coastline .

The topography of the site also presents risks to surface water. Water will flow downhill. HSF knows this. Their WMP contains a topographical map and narrative explaining how the project site slopes downhill from 150 feet elevation, to 60 feet in elevation, and finally to sea level. Manure-contaminated water will therefore flow naturally to the low points – the ditches and canals – where it will then follow the predominant surface water flow into the ocean.

Besides runoff from fields to which manure is applied, it appears obvious that precipitation will also convey nutrients from the fields and into surface waters – including the various wetlands located on and around the site.

While HDF claims that it will apply manure with an eye toward the weather, it is well-known that storms are unpredictable and deposit substantial amounts of rainwater over a very short period. HDF should be required to explain, in detail, how its lagoons were sized to deal with a 25-year, 24-hour precipitation event in addition to average monthly precipitation depths.

If the dairy were approved and constructed, such a significant rainfall event could cause the lagoons to fail and almost certainly to overflow, releasing substantial amounts of manure that will eventually flow and runoff into surface waters. The EIS should anticipate the environmental and economic impacts of a catastrophic weather event, lagoon breach, or other severe emergency constituting a "worst-case" scenario at the proposed dairy.

HDF must analyze all of these points in its EIS, and should offer a careful examination of what problems each manure constituent can create. For instance, excess phosphorus in surface waters can lead to eutrophication; bacterial contaminants such as E-coli and fecal coliform can render surface waters unsuitable for consumption, recreation, and other uses; and nitrogen (in nitrate form) can move into surface waters and, from there, percolate into the underlying aquifer, rendering the groundwater unfit for human use.

HDF's WMP does not even identify all of the wells in the project area and provides a skewed picture of how far away those wells are; for instance, while HDF claims that one county well (Koloa F) is over a half-mile away, in reality it is only 750 feet from the paddock in which sludge from the settling basin is proposed to be deposited. HDF should be required to undertake an intensive groundwater study to determine the fate and transport of nitrate to the underlying aquifer. Additionally, multiple groundwater monitoring wells should be required to be installed to monitor whether the dairy, if approved, is impacting the groundwater. If it is, then the dairy must be required to take remedial action, including possible cessation of operation.

HDF needs to analyze how manure storage and applications will interact with the wetlands on and nearby the project site. It appears that the wetlands and, indeed, much of the project site itself, comprise a large portion of the watershed that feeds the aquifer – an aquifer relied upon for clean, safe drinking water. HDF proposes to draw 3 million gallons of water per day from Grove Farm wells. As water is drawn for use in the dairy's daily operations, the concentration of nitrate in the aquifer will increase.

An investigation into whether the aquifer can support the proposed use of groundwater for daily operations should be conducted and included in the EIS. The withdrawal of 3 million gallons of water per day from an already-sensitive aquifer presents its own concerns. HDF must analyze whether the significant water drain its proposed dairy will have is sustainable in light of limited supply of fresh water provided by this aquifer.

HDF bills itself as a zero discharge operation but must prove that claim before it starts operation, including any construction activities. After conducting an intensive groundwater monitoring and modeling study, HDF may determine that is simply not feasible to put any type of manure storage lagoon in this area.

Sincerely,

P. A

Phyllis Albert

May 26, 2016

Phyllis Albert
2330 Ho'ohu Road, Poipu Crater Unit 2
Koloa HI 96756
phyllisalbert@gmail.com

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

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NRCS provides technical guidance on applying agricultural waste depending on the desired use of the waste. Reflected in the title of the livestock waste guidance for Hawai'i is the parenthetical inclusion of the word "nutrients." Where waste is utilized as a resource, it is being used for the constituent components that provide benefit.

The NRCS Conservation Practice Standard 590, Nutrient Management, applies to commercial fertilizers, organic by-products, waste water, organic matter, and irrigation water. Nutrient management is the practice of managing the amount, rate, source, method of application, and timing of plant nutrients and soil amendments. The timing and application of nutrients will correspond with plant uptake, soil properties and weather conditions. For more information on nutrient balance management see Draft EIS Section 3.5.3, and Draft EIS Appendix D.

The effluent storage ponds are sized to accommodate 30 days of storage for up to 2,000 mature dairy cows, and over 85 days of storage for 699 mature dairy cows. It will be highly unlikely that the storage pond will be full at any time for the contemplated 2,000-cow dairy, and nearly impossible for the committed 699-cow dairy. Throughout the less than 30-day storage period, effluent is planned for application every four days, and the slurry application is expected at least once every 45 days, to ensure that the ponds are kept at manageable levels.

Cows lactate milk following the birth of calves. Newborn calves will be housed on the Māhā'ulepū site and provided essential colostrum and nutrients for a healthy start. During the calves' initial 90 days, they will be transitioned to pasture at HDF before transfer to ranches on Kaua'i to be raised off-site. The committed herd size of

699 mature dairy cows at the Māhā'ulepū site applies to mature mature dairy cows. Animals in various stages of lactation and rest will be transferred between HDF and other partner ranches as needed for animal health and dairy productivity. This will benefit both the dairy and infuse the beef market in Hawai'i with a new, local source of pasture-raised calves. Male calves will become part of the beef cattle herd; heifers (young female calves that haven't given birth) will be raised until ready to return to the HDF herd as a birthing/mature dairy cow. For more information on off-site herd management, refer to Section 3.7 of the Draft EIS.

Health of the herd is of primary importance as the success of a dairy relies on cows effectively producing quality milk. All cows will be treated with a high standard of care. Dairy managers and caretakers will be trained and competent in handling animals to minimize stress and ensure the herds' welfare. A licensed veterinarian may prescribe use of antibiotics approved by the Food & Drug Administration (FDA) for treatment of illnesses. Adherence to guidelines that prohibit milk from cows undergoing antibiotic treatment will ensure no adulteration of milk. Routine laboratory tests of milk for traces of antibiotic residue will be conducted. HDF will not inject cows with bovine growth hormone, referred to as rBST or rBGH.

FLORA AND FAUNA: Botanical, avian, and mammalian surveys of the property were conducted for the Draft Environmental Impact Statement (EIS) to assess existing species on site, including identifying any species listed as endangered, threatened, or proposed under any state or federal endangered species programs in or near the property. EIS Sections 4.9 and 4.10 address the evaluation of flora and fauna resources, with technical studies in Appendix A and B.

A botanical survey of the dairy property was conducted in August 2014 by AECOS Consulting to assess existing plant species. The survey also investigated for the presence of plants currently listed as endangered, threatened or proposed for listing under Federal or the State of Hawai'i's endangered species programs, located onsite or within the immediate vicinity of the dairy site. The nature of the land and its present and historical uses for intensive agriculture very much limit the natural botanical resources anticipated to occur on this land. Complete species lists are included in the EIS, and no protected botanical species occur on the project property. The project will include vegetated buffer strips along the drainage ways as part of the Conservation Plan to reduce erosion and stabilize slopes. Where native plants occur or could survive if planted, native plants will be used in the stabilization. No long-term impacts to native plant habitats or endangered or threatened plants species will occur as a result of the dairy.

Avian and mammalian surveys were conducted in August 2014 by Rana Biological Consulting, Inc. This survey was conducted to assess the potential presence of avian or mammalian species currently listed as endangered, threatened or proposed for listing under either Federal or the State endangered species lists. The survey covered the dairy site area and immediate vicinity. Common birds and terrestrial mammals were encountered on the property. There is no critical habitat for endangered species in the upper Māhā'ulepū Valley.

Four species of endangered waterbirds were recorded on the site and at the nearby taro farm located within the HDF site. Though the area does not provide critical habitat, seabirds that nest in upland areas of Kauai may overfly the site. The endangered Hawaiian goose, nēnē was also seen on the site. State Division of Forestry and Wildlife biologists have noted nēnē are regularly seen on the subject property. It is probable that some nest on or adjacent to the site as this species nests in the general Kōloa area, and the habitat present on parts of the site is suitable for nēnē nesting.

The principal potential impacts posed to the five endangered species include those potentially associated with construction activities, and those associated with dairy farm operations following build-out. Measures will be adopted to avoid potential seabird and nēnē goose collisions with fences and structures. Potential measures include lowering construction cranes at night, using conservation fencing to project-specified areas, marking tall structures and fencing with white visibility polytape, limiting nighttime lighting, and shading any outside lights used at night. Ongoing mitigation strategies will be implemented for day-to-day preventative measures, including an Avian Species Protection Plan. Mitigation measures are further described in DEIS Section 4.10.2.

It is also likely that Hawaiian hoary bats overfly the project area on a seasonal basis. While caution will be taken during any potential disturbance or vegetation removal, there are almost no suitable roost trees within the dairy site, thus it is expected that the dairy farm will not affect this listed mammalian species.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhā'ulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The

aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhā'ulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Po'ipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhā'ulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawai'i Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhā'ulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhā'ulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhā'ulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water

quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kaua'i community.

Regional Water Demand: The adjacent, developed Kōloa-Po'ipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kaua'i will increase county-wide by 17,300 residents by 2030. The South Kaua'i population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kaua'i region (the Kōloa - Po'ipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhā'ulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhā'ulepū watershed.

The HDF site is located on the bottom-land of the upper Māhā'ulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Ha'upu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhā'ulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kaua'i Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi

Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhā'ulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhā'ulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhā'ulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural

fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Poʻipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water

masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kauaʻi community.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawaiʻi Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

Hawai'i Dairy Farms

ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE

An Environmental Impact Statement (EIS) is being prepared voluntarily by the Applicant to assess potential environmental impacts and mitigation measures associated with agricultural operations at Hawai'i Dairy Farms (HDF) at Māhā'ulepū, Kaua'i.

To assist in preparing the EIS, an Environmental Impact Statement Preparation Notice (EISPN) was recently published. A 30-day public comment period on the EISPN ends February 23, 2015. The purposes of the publication and comment period are two-fold:

1. to allow individuals and groups to request to become a consulted party; and
2. to provide written comment regarding effects of the proposed action.

NOTE: Submitted comments will be published in the Draft EIS

COMMENT

Name: Arnold & Jane Albrecht Organization: _____

Preferred contact Method

Email: jsalbrecht@hawaii.rr.com Postal Address: 1661 Pele Rd Ste 4306 Koloa, HI 96756

Phone: (Optional) 808-742-6422

Comments: Please ensure that the EIS addresses all potential impacts and costs of pollution of our ocean waters and beaches caused by animal wastes resulting from hundreds (and possibly thousands) of cows at the proposed dairy. These include:

- Runoff from the Mahaulepu watershed
- Health hazards from waste containment spills during storms and hurricanes
- Danger to drinking water sources
- Traffic problems exacerbated by transport of waste, products and other materials
- Extreme offensive odor extending for miles across valuable property effecting residences and world class beaches and causing loss of quality of life
- Cost of cleanup of beaches
- Cost to the state and tax payers for monitering and enforcement

(Continued on Page 2)

Return to:
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Attn: HDF Project
Honolulu, HI 96813
hdf@group70int.com

And/or:
Hawaii State Department of Health
Environmental Planning Office
919 Ala Moana Boulevard, Rm. 312
Honolulu, HI 96814
epo@doh.hawaii.gov

Deadline: February 23, 2015

- Cost of lost tourism and ruined reputation of Kauai's world famous beaches, particularly Poipu Beach
- Cost to residents for reduced land values at Poipu
- Loss of quality of life if there is contamination of water or beaches

In conclusion, we moved to Kauai years ago to retire in this beautiful tropical paradise where clean pure air blows through our home and the ocean and beaches are clean. Sadly now this paradise is threatened with air pollution caused by the proposed dairyand its cow manure, and the ocean and beaches also face pollution from the dairy. This project is causing anger and angst among the residents of the area, which will surely grow into additional lawsuits if this project occurs.

We request that we become a consulted party.

cc: Hawaii State Dept. of Health, Enviromental Planning Offc.
Bernard Carvalho, Mayor, County of Kauai

May 26, 2016

Arnold and Jane Albrecht
1661 Pee Road, Suite 4306
Koloa, HI 96756-9591

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Arnold and Jane Albrecht:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

DEMOGRAPHIC AND ECONOMIC: The potential impacts of Hawai'i Dairy Farms (HDF) to the existing economy were evaluated in the Draft Environmental Impact Statement (EIS), including a fiscal impact assessment report completed in April, 2016 by Plasch Economics Pacific. Draft EIS Section 4.15 addresses demographic and economic factors, with the complete report in Appendix J.

The HDF project would create short-term benefits through jobs for local construction personnel and local material suppliers. Such jobs would include equipment operators, cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, supervisors, painters, etc. Based on State employment multipliers, indirect employment related to Dairy construction would be expected to average about 16 jobs on Kaua'i, and 8 on O'ahu. Construction employment would be expected to average about 12 jobs per year during the

development period. Thus direct-plus-indirect employment association with construction would be expected to average approximately 36 jobs, of which 28 would be on Kaua'i.

The HDF project would contribute to diversification of Kaua'i's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Hawai'i Island), approximately10 percent of Hawai'i's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and indirect full-time equivalent jobs on Kaua'i, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on O'ahu.

HDF is expected to generate a net income of approximately $68,000 to the County when the 699 cow herd is established. When the dairy has matured to full production for the 699 cow dairy, net income to the State is calculated at $160,000 annually. With the potential contemplated herd size of up to 2,000 mature dairy cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be produced. This would double local milk production currently supplied by operational dairies on the Island of Hawai'i.

Additional employment generated by a possible expansion to accommodate the contemplated 2,000 mature dairy cow herd is estimated at approximately 3 construction jobs plus 4 indirect jobs on Kaua'i, and 2 indirect jobs on O'ahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an additional 5 full-time farm jobs would be added, with approximately 15 additional indirect jobs on Kaua'i and another 8 indirect jobs on O'ahu.

The dairy is expected to generate a net additional contribution to the County of approximately $8,000 for improvements related to expansion for the contemplated herd size of up to 2,000 mature dairy cows ($76,000 total versus $68,000 for the committed herd size). The State will derive approximately $360,000 annually in revenues from the contemplated 2,000-mature dairy cow dairy.

Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E

and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

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The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhāʻulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Poʻipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

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plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

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SURFACE WATER

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through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhāʻulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

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maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

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The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater

and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Po'ipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kaua'i community.

TRAFFIC: The Draft Environmental Impact Statement (EIS) Section 4.18 and 4.25 includes an evaluation of roadways and traffic conditions, along with potential impacts of the dairy farm construction and operation. Primary access to the site is via Māhā'ulepū Road, a two-way, two-lane road, which is accessible from Kōloa Road (Highway 530) via Ala Kinoiki Road. Within the project area, there is a network of unimproved private agriculture haul roads that provide access to and from Māhā'ulepū Road.

Roadways in the project area operate smoothly with no periods of heavy traffic. On average, traffic in the region is much lower than urban areas in the state due to the low population of Kaua'i and rural agricultural demographics of the south Kaua'i area and Māhā'ulepū. Traffic on Māhā'ulepū Road consists of agricultural vehicles, residential and resort visitor traffic.

During construction, the proposed project is not expected to have a significant short term impact on traffic operations in the project vicinity. Additional traffic will be

generated during construction, but will return to normal levels after project completion during day-to-day operations. There will be no change to traffic patterns or infrastructure related to the public roads.

Traffic operations along Māhā'ulepū Road and the surrounding County roads are expected to continue to operate at acceptable levels of service during peak hours of traffic. The projected increase in vehicle movements related to HDF operations for the committed herd size of 699 cows would include 5 daily employees accessing the site, milk tanker and supply trucks every two days, and truck with stock trailer, for a total of 12 additional vehicle trips per day. Daily traffic along Ala Kinoiki Road and Kōloa Road was 8,000 and 6,500 cars daily; HDF-related traffic would add less than one percent additional trips. These additional trips would have a minimal effect on traffic conditions at County roadways in the surrounding area.

At a contemplated herd size of up to 2,000 cows, an additional 11 vehicle trips per day would access the HDF site, for a total of 23 vehicle trips daily. Projections for daily vehicle movements in 2035 for Ala Kinoiki Road and Kōloa Road are 7,200 and 9,500 daily vehicles. HDF-related traffic would add less than one percent. These additional trips would have a minimal effect on traffic conditions at County roadways in the surrounding area. Traffic data is presented in the Draft EIS Sections 4.18 and 4.24.

Construction equipment mobilization will comply with Hawai'i Department of Transportation and County requirements. Delivery trucks and milk tanker trucks will be in compliance with State and County size and weight limits; no oversized vehicles will be used for ongoing operations.

AIR QUALITY: As a part of the Environmental Impact Statement (EIS), existing air quality conditions and project impacts were evaluated, including dust and odor. Potential odors and emission levels for air pollutants relevant to dairy operations were modeled, as currently there are no cows on site. EIS sections 4.19 and 4.25 provide an evaluation of air quality and odors, including a windrose depicting wind speed and direction in the area (see DEIS Section 4.1, Climate). The full air quality technical report can be found in Draft EIS Appendix I.

Clean Air Act

Under the *Clean Air Act of 1970* (CAA), amended November 1990, the U.S. Environmental Protection Agency (EPA) regulates both large and small sources of air pollutants by establishing National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. The State of Hawai'i has established its own *State Ambient Air Quality Standards* (SAAQS) that are as strict or, in some cases more strict than the NAAQS. State standards prohibit any visible emissions of fugitive dust from construction activities at the property line.

Emissions relevant to livestock operation include particulate matter and fugitive dust. Greenhouse gases related to dairy cows include methane (CH_4) from enteric fermentation, and both methane and nitrous oxide (N_20) emissions from manure

application. No State or Federal regulations for greenhouse gas emissions from farm operations or small businesses currently exist.

DUST

Dust will be generated as cows move along soft limestone walkways that connect the paddocks and lead to and from the milking parlor. Potential fugitive dust emission rates were estimated from published literature, where particulate matter (PM) is measurable from the "drylots" of confined dairy operations where animals walk over dirt and dried manure throughout the day.

Applying the emission rates from this available literature greatly overestimates potential emission resulting from HDF. Cows in the pastoral rotational-grazing system will be on pasture 22 hours each day and will spend two hours – in two separate milking cycles –moving to and from the barn for the 10- to 15-minute milking sessions.

Using atmospheric dispersion modeling system (AERMOD), the rates were scaled to the size of the non-pasture areas used by cows at HDF. Results were added to the background concentration of particulate matter (both PM_{10} and $PM_{2.5}$) measured on the island of Kaua'i, and the total concentration was compared to the State ambient air quality standards. Only the contemplated herd size of up to 2,000 milking cows was modeled, as at the lower threshold of 699 cows, the potential fugitive dust impact would be negligible. The estimated concentration for PM_{10} is 2.01 $\mu g/m^3$, well below the State standard of 150 $\mu g/m^3$. The estimated concentration for $PM_{2.5}$ is 0.23 $\mu g/m^3$, well below the Federal standard of 35 $\mu g/m^3$ (see Draft EIS Section 4.19 and Table 4-19.2).

ODOR

Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF, so air dispersion models were used to determine potential odor levels. Local weather data was used in conjunction with the AERMOD modeling system, and published rates for manure odors emissions for dairy heifers and effluent ponds were adapted to reflect the HDF facilities.

Odor emission sources identified for modeling at HDF were manure in the pasture fields, irrigation water containing diluted nutrients from effluent, the effluent storage ponds, and the dairy buildings. Odor rates from published research were applied. Odor isopleths (a line used to map all points having the same numerical value) were created to display the model findings. Odor is described in "odor units" at the threshold of perception, which is defined by the point at which 50 percent of panelists, in laboratory conditions, cannot smell the odor but 50 percent of the panelists can detect the odor.

Modeling results were generated for worst case meteorological conditions (low wind velocity / mixing). Generally, tradewinds will disperse odors to less than detectable levels beyond the HDF site; in periods of no wind, odor may not be

dispersed creating the "worst case" scenario. In these periods without normal tradewind flow, the odor plume would extend to the south of the HDF site. Sections 4.19.2 and 4.25.2 of the EIS include graphics of the potential odor isopleths.

Results for the committed herd size of 699 milking cows show that odors may be detectable by 50 percent of the sensitive population once per 200 hours, or 44 hours per year, within an area that extends approximately 1,670-feet (within one-third of a mile) beyond the dairy farm boundary, and does not reach recreational or residential areas. Results for the contemplated expanded herd size of up to 2,000 milking cows show odors would not extend beyond 2,780 feet outside the HDF boundary (just over half a mile), again not reaching recreational or residential areas, and again with detection limited to 50 percent of the sensitive population approximately 44 hours per year. The parameters used in the analysis were intentionally conservative, and the impacts shown assume an unlikely confluence of worst-case meteorological data, irrigation location, and grazing location. Actual offsite odor impacts are likely to be much lower and/or less frequent than shown; it is likely odor detection beyond the HDF boundaries will be less frequent.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

From: Jo Amsterdam <joamsterdam@hotmail.com>
Sent: Sunday, February 22, 2015 1:34 PM
To: HDF
Subject: Mega Dairy @ Maha'uelepu

Aloha HDF,

I am very concerned about the cultural,environmental,and financial aspects of this proposed dairy. The area is very sensitive for all these reasons. Our water for Poipu and Koloa will be polluted and unfit to drink as well the ocean will not be fit for swimming. For many of the visitors to this area a dairy would be the reason they do not return. There are many acres of land owned by Grove Farm which would be much more well suited for a dairy. WHY would this be the place you want to destroy? Please reconsider and find a place where the flies,smell,urine,and poop will not ruin peoples livelihood and compromise their health. Thank you. Sincerely Jo Amsterdam

GROUP 70 INTERNATIONAL

May 26, 2016

Jo Amsterdam
joamsterdam@hotmail.com

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Jo Amsterdam:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

PESTS: A study of invertebrate species and pest insects was conducted by Steven Lee Montgomery, PhD, Consulting Biologist in January 2016. The study summarizes the presence or absence of native species or pest species associated with cattle manure in the general Māhā'ulepū area, as well as the parasites and predators that control those species. No federally or state listed endangered or threatened invertebrate species were noted in the survey of the site. A full report and list of species found on site is provided in EIS Section 4.11 and Appendix B.

Flies were identified on the HDF site using manure from neighboring livestock as bait for invertebrates. The two flies associated with livestock are the stable fly and the horn fly, the latter known for biting cattle. These flies and the greenbottle fly are often confused with the house fly. Flies known to exist on Kaua'i but not seen at the HDF site include the house fly, the dog dung fly, and the chicken dung fly. These pests are common in areas with high pet populations. It is possible these fly species could

Group 70 International • 925 Bethel Street, 5th Floor • Honolulu, HI 96813-4307 • tel. 808.523.5866 • fax. 808.523.5874 • www.group70int.com

inadvertently be brought to the dairy and utilize manure as a food source. HDF will prevent and control fly population growth through diligent clean up and sanitation practices regarding any trash and food waste, as well as through efficient manure composting practices. A full list of site management measures is provided in EIS Section 4.11. The project location does not provide any habitat for *drosophila musaphilia*, the only Kaua'i species of native Hawaiian fly listed as Endangered or Threatened. Native Drosophila habitat is located many miles away in the high elevation koa-'ōhi'a forests.

Fly populations at HDF will be minimized through a process known as Integrated Pest Management (IPM). Essentially, IPM disrupts reproduction with appropriate means at key points in the pest's life cycle. Used in Hawai'i for decades, a number of invertebrates and a bird (the cattle egret) were introduced between 1898 and 1950 to reduce livestock-related insects. IPM utilizes knowledge of the ancient food web among species.

An especially important insect to minimize fly breeding habitat in manure is the dung beetle, which buries manure and incorporates it into the soil. Populations of dung beetles found on Kaua'i and those species already in Māhā'ulepū Valley, will increase with the increased manure food source, thus increasing and speeding breakdown of manure. Dung beetles are specialists in the very important natural process of breaking up and quickly recycling bovine manure pads. The behavioral diversity among dung beetle species will work together to bury dung pats in one to three days, a shorter amount of time than the 10-30 days flies eggs need to hatch.

In the Kōloa-Po'ipū region, pest fly populations are dependent upon food and breeding sources nearby such as dog, cat, and chicken feces. Beef cattle graze in the region on agricultural lands along Ala Kinoiki Road between Kōloa and Po'ipū, and it is likely the livestock-related flies identified at the HDF site occur in this region as well. Localized controls to reduce pest populations need to address breeding sites in and amongst the food and animals wastes within the area. These mitigation measures will make it difficult for flies to breed, and BMPs will be enforced to address any increase in population, therefore it is expected that the dairy farm will not significantly affect recreational and resort areas.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths –

as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhā'ulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhā'ulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Po'ipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhā'ulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawai'i Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhā'ulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhā'ulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of

groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhāʻulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kauaʻi community.

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create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Poʻipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the

Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kauaʻi community.

AIR QUALITY: As a part of the Environmental Impact Statement (EIS), existing air quality conditions and project impacts were evaluated, including dust and odor. Potential odors and emission levels for air pollutants relevant to dairy operations were modeled, as currently there are no cows on site. EIS sections 4.19 and 4.25 provide an evaluation of air quality and odors, including a windrose depicting wind speed and direction in the area (see DEIS Section 4.1, Climate). The full air quality technical report can be found in Draft EIS Appendix I.

Clean Air Act

Under the *Clean Air Act of 1970* (CAA), amended November 1990, the U.S. Environmental Protection Agency (EPA) regulates both large and small sources of air pollutants by establishing National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. The State of Hawaiʻi has established its own *State Ambient Air Quality Standards* (SAAQS) that are as strict or, in some cases more strict than the NAAQS. State standards prohibit any visible emissions of fugitive dust from construction activities at the property line.

Emissions relevant to livestock operation include particulate matter and fugitive dust. Greenhouse gases related to dairy cows include methane (CH_4) from enteric fermentation, and both methane and nitrous oxide (N_20) emissions from manure application. No State or Federal regulations for greenhouse gas emissions from farm operations or small businesses currently exist.

DUST

Dust will be generated as cows move along soft limestone walkways that connect the paddocks and lead to and from the milking parlor. Potential fugitive dust emission rates were estimated from published literature, where particulate matter (PM) is measurable from the "drylots" of confined dairy operations where animals walk over dirt and dried manure throughout the day.

Applying the emission rates from this available literature greatly overestimates potential emission resulting from HDF. Cows in the pastoral rotational-grazing system will be on pasture 22 hours each day and will spend two hours – in two separate milking cycles –moving to and from the barn for the 10- to 15-minute milking sessions.

Using atmospheric dispersion modeling system (AERMOD), the rates were scaled to the size of the non-pasture areas used by cows at HDF. Results were added to the background concentration of particulate matter (both PM_{10} and $PM_{2.5}$) measured on the island of Kaua'i, and the total concentration was compared to the State ambient air quality standards. Only the contemplated herd size of up to 2,000 milking cows was modeled, as at the lower threshold of 699 cows, the potential fugitive dust impact would be negligible. The estimated concentration for PM_{10} is 2.01 $\mu g/m^3$, well below the State standard of 150 $\mu g/m^3$. The estimated concentration for $PM_{2.5}$ is 0.23 $\mu g/m^3$, well below the Federal standard of 35 $\mu g/m^3$ (see Draft EIS Section 4.19 and Table 4-19.2).

ODOR

Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF, so air dispersion models were used to determine potential odor levels. Local weather data was used in conjunction with the AERMOD modeling system, and published rates for manure odors emissions for dairy heifers and effluent ponds were adapted to reflect the HDF facilities.

Odor emission sources identified for modeling at HDF were manure in the pasture fields, irrigation water containing diluted nutrients from effluent, the effluent storage ponds, and the dairy buildings. Odor rates from published research were applied. Odor isopleths (a line used to map all points having the same numerical value) were created to display the model findings. Odor is described in "odor units" at the threshold of perception, which is defined by the point at which 50 percent of panelists, in laboratory conditions, cannot smell the odor but 50 percent of the panelists can detect the odor.

Modeling results were generated for worst case meteorological conditions (low wind velocity / mixing). Generally, tradewinds will disperse odors to less than detectable levels beyond the HDF site; in periods of no wind, odor may not be dispersed creating the "worst case" scenario. In these periods without normal tradewind flow, the odor plume would extend to the south of the HDF site. Sections 4.19.2 and 4.25.2 of the EIS include graphics of the potential odor isopleths.

Results for the committed herd size of 699 milking cows show that odors may be detectable by 50 percent of the sensitive population once per 200 hours, or 44 hours per year, within an area that extends approximately 1,670-feet (within one-third of a mile) beyond the dairy farm boundary, and does not reach recreational or residential areas. Results for the contemplated expanded herd size of up to 2,000 milking cows show odors would not extend beyond 2,780 feet outside the HDF boundary (just over half a mile), again not reaching recreational or residential areas, and again with detection limited to 50 percent of the sensitive population approximately 44 hours per year. The parameters used in the analysis were intentionally conservative, and the impacts shown assume an unlikely confluence of worst-case meteorological data, irrigation location, and grazing location. Actual offsite odor impacts are likely to be much lower and/or less frequent than shown; it is likely odor detection beyond the HDF boundaries will be less frequent.

DEMOGRAPHIC AND ECONOMIC: The potential impacts of Hawai'i Dairy Farms (HDF) to the existing economy were evaluated in the Draft Environmental Impact Statement (EIS), including a fiscal impact assessment report completed in April, 2016 by Plasch Economics Pacific. Draft EIS Section 4.15 addresses demographic and economic factors, with the complete report in Appendix J.

The HDF project would create short-term benefits through jobs for local construction personnel and local material suppliers. Such jobs would include equipment operators, cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, supervisors, painters, etc. Based on State employment multipliers, indirect employment related to Dairy construction would be expected to average about 16 jobs on Kaua'i, and 8 on O'ahu. Construction employment would be expected to average about 12 jobs per year during the development period. Thus direct-plus-indirect employment association with construction would be expected to average approximately 36 jobs, of which 28 would be on Kaua'i.

The HDF project would contribute to diversification of Kaua'i's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Hawai'i Island), approximately10 percent of Hawai'i's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and indirect full-time equivalent jobs on Kaua'i, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on O'ahu.

HDF is expected to generate a net income of approximately $68,000 to the County when the 699 cow herd is established. When the dairy has matured to full production for the 699 cow dairy, net income to the State is calculated at $160,000 annually. With the potential contemplated herd size of up to 2,000 mature dairy cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be

produced. This would double local milk production currently supplied by operational dairies on the Island of Hawai'i.

Additional employment generated by a possible expansion to accommodate the contemplated 2,000 mature dairy cow herd is estimated at approximately 3 construction jobs plus 4 indirect jobs on Kaua'i, and 2 indirect jobs on O'ahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an additional 5 full-time farm jobs would be added, with approximately 15 additional indirect jobs on Kaua'i and another 8 indirect jobs on O'ahu.

The dairy is expected to generate a net additional contribution to the County of approximately $8,000 for improvements related to expansion for the contemplated herd size of up to 2,000 mature dairy cows ($76,000 total versus $68,000 for the committed herd size). The State will derive approximately $360,000 annually in revenues from the contemplated 2,000-mature dairy cow dairy.

Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

ALTERNATIVES: As a part of the DEIS, alternatives were evaluated that could attain the objectives of the action's purpose and need, and were compared with environmental benefits, costs, and risks of each reasonable alternative against those of the proposed dairy project. Further discussion of alternatives can be found in DEIS Section 6.

The DEIS evaluates alternatives that could attain the objectives of the action's purpose and need, and compares environmental benefits, costs, and risks of each reasonable alternative against those of the proposed action. Additionally, reasonable land use alternatives that emerged from public input during the project scoping phase are documented and briefly discussed. The alternatives that do not meet the project purpose are not advanced for analysis of environmental benefits, costs, and risks. The Environmental Impact Statement Rules, Hawai'i Administrative Rules Chapter 11-200 (HRS 11-200) requires a discussion of alternatives that could attain the objectives of the action, regardless of cost. There is no requirement for the alternatives analysis to consider every possible land use.

Four possible land uses that would not meet the project purpose are discussed. Rezoning the land for resort or residential development, or a potential conservation condemnation are two uses that were examined and eliminated from analysis. These options would not be reasonably viable given the existing private land tenure and existing zoning. Two additional alternatives were considered as reasonable land uses as they could be permitted within the existing State Land Use Agricultural District and County Agricultural Zoning District. These options include Agricultural Park with Processing Center, and development of an Agricultural Subdivision. The

alternatives were examined and eliminated from further analysis, however, as they would not fulfill the project purpose.

The analysis, therefore, focuses on alternatives that meet the project purpose. Rigorous exploration and evaluation of the environmental impacts of the alternatives, including those that might enhance environmental quality or avoid, reduce or minimize some or all of the adverse environmental effects, costs and risks. These alternatives include: (1) the development of a Conventional Feedlot Dairy (a non-pasture-based dairy) at the same location, and (2) development of the Pasture-Based Dairy at an Alternative Location on Kaua'i. The alternative of "No Action" is also evaluated. One additional alternative, considering a scenario for the Dairy Products at an Off-Island Facility, was evaluated.

Although the alternative approaches are potentially reasonable uses under existing zoning and neighboring uses, they each fail to comprehensively fulfill the requirements defined with the five established Evaluation Criteria (I-V). The essential differences as compared to the proposed action are highlighted in the following statements.

- Only one of the alternative actions (conventional feedlot alternative) would create a commercial scale dairy operation in Hawai'i, with the capability to produce 10 percent of the State's fresh milk demand, reducing dependence on imported milk (Criterion I). This alternative, however, would not be pasture-based and could negatively affect air and water quality.
- None of the alternatives would include a dairy location that meets the requirements of a pastoral, rotational-grazing dairy minimum land area, soil properties, slope conditions, water supply, land tenure and availability, and accessibility (Criterion 1).
- One alternative (Agricultural Park) could potentially generate new long-term employment in the agricultural sector on Kaua'i in a wide range of positions including pasture agronomy/soils science, livestock management, environmental resources management (Criterion 2). However, the purpose and need to provide fresh fluid milk would only be met with the Conventional Feedlot Dairy Alternative.
- The alternative for Agricultural Park could also develop sustainable food production utilizing Important Agricultural Lands, demonstrating the importance of long term agricultural leases and capital investment for agricultural infrastructure, water systems and support facilities. (Criterion 3). After many years, Grove Farm encountered limited interest in such a venture.
- Finally, addressing the range of potential environmental impacts (natural, cultural, social and economic) (Criterion 5) the four alternative scenarios would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.

In contrast, the planned agricultural operations of Hawai'i Dairy Farm, were determined after substantial analysis to be the most viable option and is the preferred alternative. Of all the alternatives considered, this is the only approach

that achieves project objectives and meets each of the five Evaluation Criteria (Section 2.3.4):

Hawai'i Dairy Farms will create a commercial scale pasture-based dairy operation in Hawai'i, with the capability to provide more than 1,000,000 gallons of the fresh milk demand, reducing dependence on imported milk (Objective 1).

- The planned dairy location that meets the requirements of minimum land area, soil properties, slope conditions, water supply, land tenure and availability, and accessibility (Criterion 1).
- The planned action will generate new long-term employment in the agricultural sector on Kaua'i, including pasture agronomy/soils science, livestock management, veterinary and animal husbandry, environmental resources management, milk/milk processing, and dairy business management (Criterion 2).
- Sustainable food production utilizing Important Agricultural Lands (Criterion 3) will occur with the proposed action, demonstrating the importance of long term agricultural leases, and the ability to draw capital investment for agricultural infrastructure including water systems and support facilities (Criterion 3).
- Address the range of potential environmental impacts by utilizing 100% of manure as natural fertilizer to grow the majority of food for cows (Criterion 4). The alternatives evaluated would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.

Creating an economically viable pasture rotational-grazing model maintains agriculture, retains open space, and provides buffer between highly utilized resort and residential development and sensitive natural or cultural resources (Criterion 5).

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

FEB 25 2015

Gary R. Anderson
P.O. Box 1300
Koloa, HI 96756
Tamazon7@ gmail.com

Via certified mail

February 21, 2015

Laura McIntyre
State of Hawai'i
Department of Health
1250 Punchbowl Street
Honolulu, HI 96813

Dear Ms. McIntyre:

I am writing to you because I am very concerned that the Hawaii Dairy Farms are doing a superficial job in assessing the damage and risks of their proposed project in Kauai. I first visited the island in 1988 and have been a taxpayer here since 1994. I'm truly amazed that your Department would have let this project proceed as far along as it has given the poor quality of this location and the concerns that need to be addressed by their EIS statement. Surely on an island that's over 550 square MILES in size, there can be a better site than Mahaulepu.

My first request is that the EIS preparers do a professional job in modelling the flow of the groundwater. Our drinking water comes from wells that I understand will be less than 1000 ft. away from **MILLIONS,** yes **MILLIONS**, of pounds of manure spread out over hundreds of acres of soil. I can't imagine they could do this project without drilling a series of monitoring wells, and 3D modelling the flows in and near the aquifer(s) over a period of years These wells supply drinking water to the TENS of THOUSANDS of residents and visitors in Koloa & Poipu.

I lived here in Kauai during the 30 days of rain in 2006 that washed billions of gallons of effluent into the streams, reservoirs, lakes and the ocean all around the island. All that manure may wash into the ocean, or more ominously, contaminate our drinking water. WHY TAKE THAT CHANCE? You can't possibly model how the bowl shaped region and the subsurface flows will react to the frequent rain without a long term study. What if the 2006 floods were a once a decade event? A "quick and dirty" single point in time study seems crazy given the long term impacts.

I also question whether the consultants at Group 70 are the right guys to prepare the EIS. They have a vested interest in the outcome of the project. Presumably, you want an independent third party to prepare this important document, not an "insider".

The second major point is the completely misleading statements made in the Group 70 proposal about the "Socio-Economic Conditions". I would challenge them on just about all of the points they wrote on page 3-3. If you add up the number of bedrooms in each lodging unit in the Poipu area, and then multiply by at least 2 (for occupants) you would get far more than "2139 housing units" they cite. *It's not about the number of structures; it's about the number of people* who will be affected by the smell of millions of pounds of manure, 24 hours a day.

This is a County designated Visitor Destination Area and it is simply not true that 56.2% of the units are always vacant. I rent out my own property when I'm not here and we had over 90% occupancy last year. I'm sure if Group 70 did a proper analysis and listed all of the lodging options in the Koloa/ Poipu area, (hotels, condos, homes, apartments, and time shares), and then included the number of bedrooms in each unit (since most condos and homes have more than 1 bedroom) , and then multiplied by at least a factor of 2 (since most visitors are couples, followed by families (more than 2), then followed by singles) times an appropriate "occupancy rate" for each type of unit you would have a better sense of the impact this project could have on the community. I can assure you that most planning professionals know that timeshares (aka fractional ownership) have the highest level of impact on the community. Projects like the Point at Poipu, or the Marriot Waiohai usually run with 90+% occupancy, 365 days a year.

The data is available, make sure they collect it and analyze it properly.

Very truly yours,

Gary R. Anderson

GROUP 70 INTERNATIONAL

May 26, 2016

Gary R. Anderson
P.O. Box 1300
Koloa, HI 96756
Tamazon7@gmail.com

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Gary R. Anderson:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

Your comments were received by the State of Hawai'i Department of Health Environmental Planning office. The Department of Health forwarded a copy of your comments to Group 70 International in order to be included in the Draft Environmental Impact Statement (EIS) analysis. This letter was prepared in response to your comments.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

GROUP 70 OBJECTIVITY: Group 70 International, Inc. (Group 70) is responsible for the preparation and processing of the Hawai'i Dairy Farms Environmental Impact Statement (EIS). The EIS was prepared in accordance with the requirements of Chapter 343 Hawai'i Revised Statutes and the "Environmental Impact Statement Rules" (Chapter 200 of Title 11, Hawai'i Administrative Rules). The environmental

planning team at Group 70 has prepared several hundred Environmental Assessment and EIS documents over the past 40 years, and every document has been accepted by the responsible County, State and Federal agency. On numerous past EIS projects, the Hawai'i Chapter of the American Planning Association has recognized Group 70's professional work with Chapter awards for excellence in environmental planning. Part of the EIS scoping process involves Group 70's experienced team of technical sub consultants that are well-known and qualified in their respective fields of study. For this project, Group 70 is preparing the Hawai'i Dairy Farms EIS with the level of analysis required to properly evaluate and disclose the existing environmental conditions, probable impacts with mitigation, and potential cumulative and secondary effects.

NATURAL HAZARDS: The potential impacts of natural hazards are evaluated in the Draft Environmental Impact Statement (EIS), including flooding, tsunami, earthquakes, and hurricanes. Draft EIS Section 4.6 addresses natural hazards.

The Māhā'ulepū property is not known to experience flooding conditions. The area is located within Federal Emergency Management Agency (FEMA) Zone X, areas determined to be outside the 0.2% annual chance floodplain. The proposed location for Hawai'i Dairy Farms (HDF) lies between the 60 and 150 feet elevation, outside the tsunami evacuation zone. The Kaua'i and Ni'ihau region of the Hawaiian Islands has experienced tremors from earthquakes originating further south in the island chain, but no known seismic activity has originated among these northern islands.

Although they occur infrequently, Kaua'i has received a greater amount of damage from hurricanes when compared to the other Hawaiian Islands. Land management personnel in the Māhā'ulepū region during and following the hurricanes that affected Kaua'i in 1982 and 1992 observed defoliation of vegetation, and no flooding events in the period following passage of the storms.

Preparedness is the best protection for natural disasters. Structural design of dairy facilities will meet International Building Code (IBC) 2006 standards with local amendments. Provisions in design will address wind loading (including hurricane gusts), rain and flood loading, and earthquake loading. A geotechnical evaluation of the area recommended Seismic Site Class D under IBC standards be utilized for foundation design where the barns and agricultural infrastructure will be constructed.

There has been no rainfall event that would exceed the capacity of the effluent ponds since rainfall has been recorded in Māhā'ulepū Valley. The effluent pond capacity has been designed above the regulatory requirement to contain the 25-year, 24-hour rainfall event. An emergency containment berm with additional capacity for another 30 days is included in the design. This design exceeds regulatory requirements, with containment in excess of the major rainfall events recorded on Kaua'i over the past three decades.

An emergency preparedness plan for protection of animals has been prepared for HDF internal use that addresses hurricane, fire, and potential flooding hazard scenarios. HDF is not in a tsunami inundation area, so this scenario is not planned

for in the disaster plan. The disaster plan relies upon knowledge of cow behavior, and is based on extensive guidance for livestock protection from NRCS, the Florida State Agricultural Response Team (SART), Pennsylvania State College of Agricultural Sciences, and Cornell University Cooperative Extension. The plan includes safety procedures during any disaster, follow up actions, and emergency contacts for assistance before, during or following the event. Further information is provided in the Draft EIS Section 4.6.2.

DEMOGRAPHIC AND ECONOMIC: The potential impacts of Hawai'i Dairy Farms (HDF) to the existing economy were evaluated in the Draft Environmental Impact Statement (EIS), including a fiscal impact assessment report completed in April, 2016 by Plasch Economics Pacific. Draft EIS Section 4.15 addresses demographic and economic factors, with the complete report in Appendix J.

The HDF project would create short-term benefits through jobs for local construction personnel and local material suppliers. Such jobs would include equipment operators, cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, supervisors, painters, etc. Based on State employment multipliers, indirect employment related to Dairy construction would be expected to average about 16 jobs on Kaua'i, and 8 on O'ahu. Construction employment would be expected to average about 12 jobs per year during the development period. Thus direct-plus-indirect employment association with construction would be expected to average approximately 36 jobs, of which 28 would be on Kaua'i.

The HDF project would contribute to diversification of Kaua'i's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Hawai'i Island), approximately10 percent of Hawai'i's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and indirect full-time equivalent jobs on Kaua'i, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on O'ahu.

HDF is expected to generate a net income of approximately $68,000 to the County when the 699 cow herd is established. When the dairy has matured to full production for the 699 cow dairy, net income to the State is calculated at $160,000 annually. With the potential contemplated herd size of up to 2,000 mature dairy cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be produced. This would double local milk production currently supplied by operational dairies on the Island of Hawai'i.

Additional employment generated by a possible expansion to accommodate the contemplated 2,000 mature dairy cow herd is estimated at approximately 3 construction jobs plus 4 indirect jobs on Kaua'i, and 2 indirect jobs on O'ahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an additional 5 full-time farm jobs would be added, with approximately 15 additional

indirect jobs on Kaua'i and another 8 indirect jobs on O'ahu.

The dairy is expected to generate a net additional contribution to the County of approximately $8,000 for improvements related to expansion for the contemplated herd size of up to 2,000 mature dairy cows ($76,000 total versus $68,000 for the committed herd size). The State will derive approximately $360,000 annually in revenues from the contemplated 2,000-mature dairy cow dairy.

Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhā'ulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhā'ulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Po'ipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhā'ulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawai'i Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhā'ulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhā'ulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhā'ulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kaua'i community.

Regional Water Demand: The adjacent, developed Kōloa-Po'ipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kaua'i will increase county-wide by 17,300 residents by 2030. The South Kaua'i population is estimated to reach 16,855 in 2035, when it is projected to

encompass 19.2 percent of the County population. For the South Kaua'i region (the Kōloa - Po'ipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

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The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhā'ulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhā'ulepū watershed.

The HDF site is located on the bottom-land of the upper Māhā'ulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Ha'upu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhā'ulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kaua'i Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhā'ulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhā'ulepū and adjacent watersheds. DOH conducted water sampling

within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhā'ulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhā'ulepū will carry three

times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Poʻipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring

program will be shared with the DOH CWB, dairy neighbors and the local Kauaʻi community.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawaiʻi Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

RECEIVED

FEB 24 2015

GROUP 70 INTL

Hawai'i Dairy Farms

MAHA'ULEPU, KAUA'I

ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE

An Environmental Impact Statement (EIS) is being prepared voluntarily by the Applicant to assess potential environmental impacts and mitigation measures associated with agricultural operations at Hawai'i Dairy Farms (HDF) at Māhā'ulepū, Kaua'i.

To assist in preparing the EIS, an Environmental Impact Statement Preparation Notice (EISPN) was recently published. A 30-day public comment period on the EISPN ends February 23, 2015. The purposes of the publication and comment period are two-fold:

1. to allow individuals and groups to request to become a consulted party; and
2. to provide written comment regarding effects of the proposed action.

NOTE: Submitted comments will be published in the Draft EIS

COMMENT

Name: Ka'ehulani Organization: NONE

Preferred contact Method

Email: —— Postal Address: P.O. Box 473, LAWAI, HI 96765

Phone: (Optional) ——

Comments: 'A'ole ~~hiki iā mākou ke~~ ho'omaka i ia kēia 'aha kūkākūkā i ke 'ano o ka mo'omeheu Hawai'i. Inā 'oukou e hele mai i Kaua'i a hana pū ma laila, pono 'oukou e ho'omaka i ka ua 'aha kūkākūkā lā i kekahi pule Hawai'i. He mea 'āpiki no ka 'ōleto 'ana 'oe i kekahi kāne 'o ia i 'kū ai kokoke i ka 'īpuka "E kulikuli 'oe!"

1) Makemake au e ha'i aku iā 'oukou — No ke aha 'oukou e ne'e ai i kēlā hui 'o "Hawai'i Dairy Farms" ma ka 'āina nani loa 'o Māhā'ulepū?
2) Pono 'oukou e pane i ka lehulehu ma Kōloa i nā noi a lākou i ka manawa kūpono.
3) Pīlau ke kūkae o nā pīpī — Auwē!
4) 'A'ole makemake ka po'e o Kōloa i kekahi hui NUI (corporation)

Return to:

Group 70 International, Inc.
925 Bethel Street, 5th Floor
Attn: HDF Project
Honolulu, HI 96813
hdf@group70int.com

And/or:

Hawaii State Department of Health
Environmental Planning Office
919 Ala Moana Boulevard, Rm. 312
Honolulu, HI 96814
epo@doh.hawaii.gov

Deadline: February 23, 2015

ma kēia 'āina.

5) He kanakolukūmāmālua miliona mau pauna o KŪKAE i ho'okahi makahiki?
6) He aha ka pilikia i ka wai — maka'u mākou i ka 'emi loa o ke kahawai 'o Waikomo a me Waihohonu.

ENVIRONMENTAL IMPACT STATEMENT

HAWAII DAIRY FARMS
MĀHĀ'ULEPŪ, KAUA'I

1) Māhā'ulepū is an almost pristine environment and one of the few wild places left on Kaua'i. I fear that development is just "around the corner," and maybe staking a flag in that piece of property is the foot in the door. Please consider a different place for a dairy farm.

2) The smell of a dairy is overwhelming. Cows fart all the time. This dairy is really close to Kōloa the tradewinds blow from NE most of the time so we'll have to be smelling that stink. It will also affect Po'ipu, our main visitor destination & the hotels that line the shoreline will be impacted including thousands of employees

3) This is a culturally sensitive area for Hawaiian people. There are heiau in this area, houses and farming remnants were discovered here including the Kōloa field system, one of the largest agricultural and archeologically important historical sites.

4) Where will the water come from? Waters held in trust for the Hawaiian people. Our streams here in Kōloa, Wākomo and Waihohonu are already dangerously low. I believe it will be contaminated by a large scale dairy farm.

5) We in Kōloa do not need a major corporation here in our small village. It is an inappropriate location for such a large-scale operation. And we residents of Kōloa had no opportunity to comment BEFORE this deal was "signed, sealed and delivered."

I felt it was very inappropriate for the Hawai'i Dairy Farms planner to begin the meeting on February 19 without a Hawaiian blessing of some sort. If you come to Kaua'i, it would be a good thing to read up on the culture here, to familiarize yourself with the way we like to do things round here. Be respectful, polite, ask permission.

It was very rude of the HDF planner to ignore a simple plea from a Hawaiian man standing by the door that our meetings always begin with a Hawaiian prayer.

In short I feel the people of Kōloa have been railroaded. I don't believe there was even one person who was in that Kōloa School cafeteria that is "FOR" the dairy, aside from the consultants who are being paid to support this project.

I am concerned about the place, the smell, the water, the soil, proximity to tourism & the town of Kōloa — JODI ASCUENA

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FEB 24 2015

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— JODI ASCUENA

May 26, 2016

Jodi (Ka'ehulani) Ascuena
P.O. Box 473
Lawai, HI 96765

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Jodi (Ka'ehulani) Ascuena:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

Your comments were received by the State of Hawai'i Department of Health Environmental Planning office. The Department of Health forwarded a copy of your comments to Group 70 International in order to be included in the Draft Environmental Impact Statement (EIS) analysis. This letter was prepared in response to your comments.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

ARCHAEOLOGICAL AND CULTURAL: The Hawai'i Dairy Farms (HDF) project is subject to a historic preservation review by the State Department of Land and Natural Resources, State Historic Preservation Division (SHPD) under HRS Chapter 6E and Chapter 13-284. An Archaeological Inventory Survey (AIS) and a Cultural Impact Assessment (CIA) were conducted by Scientific Consultant Services (SCS) for the

proposed project. EIS Sections 4.7 and 4.8 provide an evaluation of archaeology and cultural resources, with technical studies in Appendix G and H.

A total of sixteen historic properties were identified through a pedestrian survey of the project area and an extended survey area of 100 meters of the northern boundary. Six historic-era sites occur in the project area and 10 sites occur in the extended survey area. Only one of the sites is believed to be associated with pre-Contact and/or early historic times. State Site 50-30-10-2250, the agricultural heiau, and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area. The remaining sites consist of historic-era bridges, ditches, culverts, retaining walls, and a flume system dating from the 20th century and are affiliated with sugarcane cultivation.

That a majority of the documented sites are related to the historic-era is not surprising, given the massive landscape modifications that occurred during intensive sugarcane cultivation on the valley floor. Even historic era cultural materials associated with the many Land Commission Awards in the project area were non-existent, as explored through survey and subsurface exploration.

The sixteen historic properties have been assessed for significance by the archaeological consultant and the dairy project is anticipated to have no impact on these sites. No further archaeological work is recommended for the sites. Two of the sixteen sites are considered significant under multiple criteria, but occur outside the project area on lands owned by a different landowner. Both sites will not be adversely affected by the proposed dairy project. No site is related to burials, and no bonex were found. Such sites have been reported along coastal areas in sand dunes.

The cultural assessment examined the potential effect of the project on cultural resources, practices or beliefs, its potential to isolate cultural resources, practices or beliefs from their setting, and the potential of the project to introduce elements which may alter the setting in which cultural practices take place. Information received from the community indicates the Māhā'ulepū Ahupua'a, has been and is currently used for traditional cultural purposes. However, the dairy project area has not been included in these activities. It is clear that the gathered plants, trails, State Site 50-30-10-2250, the agricultural heiau, and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area.

The project will be fully enclosed by perimeter fencing along the boundary of the leased premises, which will ensure that project activities and any related impacts are contained within the project area. Based on the research and comments received from the community, it is reasonable to conclude that, pursuant to Act 50, the exercise of native Hawaiian rights or any ethnic group related to numerous traditional cultural practices will not be impacted by establishment of the dairy.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The

location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhāʻulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhāʻulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Poʻipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhāʻulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

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evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhāʻulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

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Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kauaʻi Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhāʻulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhāʻulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhāʻulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Poʻipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kaua'i community.

AIR QUALITY: As a part of the Environmental Impact Statement (EIS), existing air quality conditions and project impacts were evaluated, including dust and odor. Potential odors and emission levels for air pollutants relevant to dairy operations were modeled, as currently there are no cows on site. EIS sections 4.19 and 4.25 provide an evaluation of air quality and odors, including a windrose depicting wind speed and direction in the area (see DEIS Section 4.1, Climate). The full air quality technical report can be found in Draft EIS Appendix I.

Clean Air Act

Under the *Clean Air Act of 1970* (CAA), amended November 1990, the U.S. Environmental Protection Agency (EPA) regulates both large and small sources of air pollutants by establishing National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. The State of Hawai'i has established its own *State Ambient Air Quality Standards* (SAAQS) that are as strict or, in some cases more strict than the NAAQS. State standards prohibit any visible emissions of fugitive dust from construction activities at the property line.

Emissions relevant to livestock operation include particulate matter and fugitive dust. Greenhouse gases related to dairy cows include methane (CH_4) from enteric fermentation, and both methane and nitrous oxide (N_20) emissions from manure

application. No State or Federal regulations for greenhouse gas emissions from farm operations or small businesses currently exist.

DUST

Dust will be generated as cows move along soft limestone walkways that connect the paddocks and lead to and from the milking parlor. Potential fugitive dust emission rates were estimated from published literature, where particulate matter (PM) is measurable from the "drylots" of confined dairy operations where animals walk over dirt and dried manure throughout the day.

Applying the emission rates from this available literature greatly overestimates potential emission resulting from HDF. Cows in the pastoral rotational-grazing system will be on pasture 22 hours each day and will spend two hours – in two separate milking cycles –moving to and from the barn for the 10- to 15-minute milking sessions.

Using atmospheric dispersion modeling system (AERMOD), the rates were scaled to the size of the non-pasture areas used by cows at HDF. Results were added to the background concentration of particulate matter (both PM_{10} and $PM_{2.5}$) measured on the island of Kaua'i, and the total concentration was compared to the State ambient air quality standards. Only the contemplated herd size of up to 2,000 mature dairy cows was modeled, as at the lower threshold of 699 cows, the potential fugitive dust impact would be negligible. The estimated concentration for PM_{10} is 2.01 $\mu g/m^3$, well below the State standard of 150 $\mu g/m^3$. The estimated concentration for $PM_{2.5}$ is 0.23 $\mu g/m^3$, well below the Federal standard of 35 $\mu g/m^3$ (see Draft EIS Section 4.19 and Table 4-19.2).

ODOR

Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF, so air dispersion models were used to determine potential odor levels. Local weather data was used in conjunction with the AERMOD modeling system, and published rates for manure odors emissions for dairy heifers and effluent ponds were adapted to reflect the HDF facilities.

Odor emission sources identified for modeling at HDF were manure in the pasture fields, irrigation water containing diluted nutrients from effluent, the effluent storage ponds, and the dairy buildings. Odor rates from published research were applied. Odor isopleths (a line used to map all points having the same numerical value) were created to display the model findings. Odor is described in "odor units" at the threshold of perception, which is defined by the point at which 50 percent of panelists, in laboratory conditions, cannot smell the odor but 50 percent of the panelists can detect the odor.

Modeling results were generated for worst case meteorological conditions (low wind velocity / mixing). Generally, tradewinds will disperse odors to less than detectable levels beyond the HDF site; in periods of no wind, odor may not be dispersed creating the "worst case" scenario. In these periods without normal tradewind flow, the odor

plume would extend to the south of the HDF site. Sections 4.19.2 and 4.25.2 of the EIS include graphics of the potential odor isopleths.

Results for the committed herd size of 699 mature dairy cows show that odors may be detectable by 50 percent of the sensitive population once per 200 hours, or 44 hours per year, within an area that extends approximately 1,670-feet (within one-third of a mile) beyond the dairy farm boundary, and does not reach recreational or residential areas. Results for the contemplated expanded herd size of up to 2,000 mature dairy cows show odors would not extend beyond 2,780 feet outside the HDF boundary (just over half a mile), again not reaching recreational or residential areas, and again with detection limited to 50 percent of the sensitive population approximately 44 hours per year. The parameters used in the analysis were intentionally conservative, and the impacts shown assume an unlikely confluence of worst-case meteorological data, irrigation location, and grazing location. Actual offsite odor impacts are likely to be much lower and/or less frequent than shown; it is likely odor detection beyond the HDF boundaries will be less frequent.

ALTERNATIVES: As a part of the DEIS, alternatives were evaluated that could attain the objectives of the action's purpose and need, and were compared with environmental benefits, costs, and risks of each reasonable alternative against those of the proposed dairy project. Further discussion of alternatives can be found in DEIS Section 6.

The DEIS evaluates alternatives that could attain the objectives of the action's purpose and need, and compares environmental benefits, costs, and risks of each reasonable alternative against those of the proposed action. Additionally, reasonable land use alternatives that emerged from public input during the project scoping phase are documented and briefly discussed. The alternatives that do not meet the project purpose are not advanced for analysis of environmental benefits, costs, and risks. The Environmental Impact Statement Rules, Hawai'i Administrative Rules Chapter 11-200 (HRS 11-200) requires a discussion of alternatives that could attain the objectives of the action, regardless of cost. There is no requirement for the alternatives analysis to consider every possible land use.

Four possible land uses that would not meet the project purpose are discussed. Rezoning the land for resort or residential development, or a potential conservation condemnation are two uses that were examined and eliminated from analysis. These options would not be reasonably viable given the existing private land tenure and existing zoning. Two additional alternatives were considered as reasonable land uses as they could be permitted within the existing State Land Use Agricultural District and County Agricultural Zoning District. These options include Agricultural Park with Processing Center, and development of an Agricultural Subdivision. The alternatives were examined and eliminated from further analysis, however, as they would not fulfill the project purpose.

The analysis, therefore, focuses on alternatives that meet the project purpose. Rigorous exploration and evaluation of the environmental impacts of the alternatives, including those that might enhance environmental quality or avoid, reduce or minimize some or all of the adverse environmental effects, costs and risks. These alternatives include: (1)

the development of a Conventional Feedlot Dairy (a non-pasture-based dairy) at the same location, and (2) development of the Pasture-Based Dairy at an Alternative Location on Kaua'i. The alternative of "No Action" is also evaluated. One additional alternative, considering a scenario for the Dairy Products at an Off-Island Facility, was evaluated.

Although the alternative approaches are potentially reasonable uses under existing zoning and neighboring uses, they each fail to comprehensively fulfill the requirements defined with the five established Evaluation Criteria (I-V). The essential differences as compared to the proposed action are highlighted in the following statements.

- Only one of the alternative actions (conventional feedlot alternative) would create a commercial scale dairy operation in Hawai'i, with the capability to produce 10 percent of the State's fresh milk demand, reducing dependence on imported milk (Criterion I). This alternative, however, would not be pasture-based and could negatively affect air and water quality.
- None of the alternatives would include a dairy location that meets the requirements of a pastoral, rotational-grazing dairy minimum land area, soil properties, slope conditions, water supply, land tenure and availability, and accessibility (Criterion 1).
- One alternative (Agricultural Park) could potentially generate new long-term employment in the agricultural sector on Kaua'i in a wide range of positions including pasture agronomy/soils science, livestock management, environmental resources management (Criterion 2). However, the purpose and need to provide fresh fluid milk would only be met with the Conventional Feedlot Dairy Alternative.
- The alternative for Agricultural Park could also develop sustainable food production utilizing Important Agricultural Lands, demonstrating the importance of long term agricultural leases and capital investment for agricultural infrastructure, water systems and support facilities. (Criterion 3). After many years, Grove Farm encountered limited interest in such a venture.
- Finally, addressing the range of potential environmental impacts (natural, cultural, social and economic) (Criterion 5) the four alternative scenarios would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.

In contrast, the planned agricultural operations of Hawai'i Dairy Farm, were determined after substantial analysis to be the most viable option and is the preferred alternative. Of all the alternatives considered, this is the only approach that achieves project objectives and meets each of the five Evaluation Criteria (Section 2.3.4):

Hawai'i Dairy Farms will create a commercial scale pasture-based dairy operation in Hawai'i, with the capability to provide more than 1,000,000 gallons of the fresh milk demand, reducing dependence on imported milk (Objective 1).

- The planned dairy location that meets the requirements of minimum land area, soil properties, slope conditions, water supply, land tenure and availability, and accessibility (Criterion 1).

- The planned action will generate new long-term employment in the agricultural sector on Kaua'i, including pasture agronomy/soils science, livestock management, veterinary and animal husbandry, environmental resources management, milk/milk processing, and dairy business management (Criterion 2).
- Sustainable food production utilizing Important Agricultural Lands (Criterion 3) will occur with the proposed action, demonstrating the importance of long term agricultural leases, and the ability to draw capital investment for agricultural infrastructure including water systems and support facilities (Criterion 3).
- Address the range of potential environmental impacts by utilizing 100% of manure as natural fertilizer to grow the majority of food for cows (Criterion 4). The alternatives evaluated would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.

Creating an economically viable pasture rotational-grazing model maintains agriculture, retains open space, and provides buffer between highly utilized resort and residential development and sensitive natural or cultural resources (Criterion 5).

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

-----Original Message-----
From: Janet Ashkenazy [mailto:cavemom38@yahoo.com]
Sent: Saturday, February 28, 2015 11:39 AM
To: EPO; Ken Taylor
Subject: Re: Perhaps a dairy is not end goal

Chopping up the earth is a hideous trend of billionaires, not only on Kauai. Consider what is happening in Nicaragua where a billionaire Chinese developer is tearing up the earth and a huge lake down there to carve a canal the width of three football fields to join the atlantic and pacific. Already the rainforest there has suffered massive destruction simply to put a road in to build the damned thing. AN EIS has been initiated, but never mind, the work goes on despite the incomplete EIS. Huge amounts of dirt will be moved. Farmers will be displaced. The huge lake there will be destroyed due to dirt pileups. No more fishing. No more farming. People will be given a "fair payment " (HAH!) for their properties which allowed them to make a living. China will use their newly built roads to haul Nicaragua's valuable resources to china. THOSE FUCKING BASTARDS!

On Sat, 2/28/15, Ken Taylor <taylork021@hawaii.rr.com> wrote:

Subject: Perhaps a dairy is not end goal
To: "Hawaii State Department og Health" <epo@doh.hawaii.gov>
Date: Saturday, February 28, 2015, 9:23 AM

Know
the history and history will set you free ! !
!

May 26, 2016

Janet Ashkenazy
cavemom38@yahoo.com

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Janet Ashkenazy:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

Your comments were received by the State of Hawai'i Department of Health Environmental Planning office. The Department of Health forwarded a copy of your comments to Group 70 International in order to be included in the Draft Environmental Impact Statement (EIS) analysis. This letter was prepared in response to your comments.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

Group 70 International, Inc. (Group 70) is responsible for the preparation and processing of the Hawai'i Dairy Farms Environmental Impact Statement (EIS). The EIS was prepared in accordance with the requirements of Chapter 343 Hawai'i Revised Statutes and the "Environmental Impact Statement Rules" (Chapter 200 of Title 11, Hawai'i Administrative Rules). The environmental planning team at Group 70 has prepared several hundred Environmental Assessment and EIS documents over the past 40 years, and every document has been accepted by the responsible County, State and Federal agency. On numerous past EIS projects, the Hawai'i Chapter of the American Planning Association has recognized Group 70's

professional work with Chapter awards for excellence in environmental planning. Part of the EIS scoping process involves Group 70's experienced team of technical sub consultants that are well-known and qualified in their respective fields of study. For this project, Group 70 is preparing the Hawai'i Dairy Farms EIS with the level of analysis required to properly evaluate and disclose the existing environmental conditions, probable impacts with mitigation, and potential cumulative and secondary effects.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

RECEIVED

FEB 24 2015

GROUP 70 INTL

From: T B tbari36@yahoo.com
Subject: vote "no" for dairy at Maha'ulepu
Date: February 20, 2015 at 4:15 PM
To: epo@doh.hawaii.gov, hdf@group70int.com

Along with thousands of others, I do not want a dairy at Maha'ulepu, Island of Kauai, Hawai'i nei.
The HDF can use the former Meadow Gold Dairy site on the east side of the island instead of the pristine land in Maha'ulepu.

Any development in Maha'ulepu will cause irrevocable loss and destruction to one of Kauai's most important natural open spaces.

Public health and social welfare will be adversely affected by the damage that would be caused by dairy construction and waste management.

Local residents and tourists enjoy visiting this area as it is now without the harmful invasion of buildings, vehicle and noise pollution, and the tonnage of daily animal waste. The Meadow Gold Dairy closed due to expensive operating costs. It is most likely that another dairy would also lose money and leave a mess of building debris.

Fresh water is a high priority on Kauai. Local residents and tourists consistently conserve water. Millions of gallons of water will be wasted on a dairy in the middle of Maha'ulepu, one the drier regions on Kauai.

In the past, Steve Case purchased vast acreage with the intention of keeping the land "open". Maha'ulepu must remain open.
If Mr. Case and HDF would still like to maintain an interest in milk, they could consider planting sustainable almond orchards to produce almond milk.

Please avoid the destruction of Maha'ulepu by rejecting the HDF dairy request.

Mahalo.
Terese Barich
2224 Walelia Pl.
Koloa, HI 96766

GROUP 70 INTERNATIONAL

May 26, 2016

Terese Barich
2224 Walelia Place
Koloa, HI 96756
tbari36@yahoo.com

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Terese Barich:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

DAIRY OPERATIONS: Hawai'i Dairy Farms (HDF) will establish and operate a sustainable, pastoral rotational-grazing dairy farm in Māhā'ulepū Valley on the island of Kaua'i to produce fresh, locally available nutritious milk for Hawai'i families. The rotational-grazing method utilizes 100 percent of the cows' manure as natural fertilizer to grow pasture grass as a primary source of nutrition for dairy cows. This cost-effective method will reduce reliance on imported fertilizer and feed. Pasture grass will comprise at least 70 percent of the animals' diet. As a part of the Draft Environmental Impact Statement (EIS), the proposed facilities and operations for the dairy farm are described in Chapter 3.

The Environmental Impact Statement (EIS) Preparation Notice (EISPN), published January 23, 2015, described the proposed pasture-based rotational grazing system

as a "zero-discharge, grass-fed dairy". The term "zero-discharge" under the U.S. Environmental Protection Agency related to concentrated feeding operations (CAFO) is a system designed to not discharge pollutants into waters of the United States. As noted previously, the HDF system is designed to utilize 100 percent of the cows' manure on-site. However, nutrients would be introduced to the HDF site with any use; the Draft EIS identifies the amount of nutrients anticipated from the proposed dairy operations that could pass through to ground and surface waters. Therefore, HDF elected to discontinue use of the term "zero discharge" as it was construed as no nutrients into the system.

The term "grass-fed" was used in the HDF EISPN. This term was used to identify HDF's intent to utilize a locally-produced feedstock – grass – for more than 70 percent of the dairy herds' diet. In January 2016, the U.S. Department of Agricultural (USDA) Marketing Survey created a narrow legal definition of "grass-fed". The USDA standard defines what animals can and cannot be fed. The Food Alliance, a project of several northwest colleges, believes that when consumers choose grass-fed products there is an expectation that these will come from animals raised on pasture on a forage-based diet. Due to the evolving definition of "grass-fed", the term in not used in this EIS.

The dairy facilities will occupy an area of approximately 10 acres on the western boundary of the site. The developed area "footprint" will be less than 2 percent of the total farm area. Four buildings will be constructed to serve different functions, supported by utilities and infrastructure. Additional building information can be found in Draft EIS Section 3.3.1.

Agricultural infrastructure and utilities required for the dairy operations will include storage tanks and silos, effluent storage ponds, livestock water systems, and drainage improvements. The irrigation system and distribution of livestock water are discussed in Draft EIS Section 3.5, Pasture Management.

The pastoral rotational-grazing dairy provides a local feedstock – grass – as the herd's primary food source. Reducing imported feed stabilizes costs and provides a food source closer to the natural diet of cows. Results of grass trials initially conducted at five sites across four Hawaiian Islands were instrumental in identifying appropriate varieties of grass, and suitable sites to support sufficient "dry matter" grass yields essential to a cow's diet. Additional project-specific trials at the Māhāʻulepū site on Kauai have been conducted for more than 18 months. The results have identified sufficient yield and nutrition to supply 70 percent of the cows' diet; improvements in grass productivity are anticipated to provide up to 85 percent of cows' diet.

The pasture-based model allows cows to move about freely, and to lie down and rest, which is part of the digestion cycle. The animals are managed in social groups known as "mobs", mimicking the natural social order of bovines. Cows spend 22 hours of each 24-hour period foraging on pasture or resting, outdoors in natural light and fresh air. The gently sloped paddocks, walkways and races minimize the energy expended by the mature dairy cows as they graze or are transferred to and from the various paddocks and the mature dairy facility; surfaces of the walkways

and cow races are designed to provide a comfortable path under hoof. The management practices and pasture model applied by HDF maximizes grass as the cows' primary nutrition source and minimizes stress to the animals. Cows tend to be healthier and live longer, productive lives with access to fresh air, high quality feed, and exercise while they forage.

The 470 acres of pasture will be divided into paddocks averaging 3 to 5 acres in size. Smaller paddocks located near the dairy facility will be used as temporary pasture for cows or calves being moved on or off the farm. To protect the water quality of surface water and downstream areas, paddock fences are set back 35 feet from the edge of drainage ways throughout the site. Existing vegetation within the setbacks will be managed or restored to reduce erosion, improve stability of ditch banks, increase net carbon storage, and improve and maintain water quality.

The majority of the pastures will be irrigated with non-potable water and/or diluted effluent through either the pivot irrigation systems or through gun irrigators. Irrigation water supply is provided to the farm from Waita Reservoir, and will be filtered and pumped to the various irrigation components on the farm. The irrigation system is controlled using computer software and GPS receivers to allow very precise application of irrigation and/or diluted effluent on the pasture. The pivots can rotate and apply irrigation water and/or diluted effluent at different rates depending on the actual irrigation needs of the farm.

NRCS provides technical guidance on applying agricultural waste depending on the desired use of the waste. Reflected in the title of the livestock waste guidance for Hawaiʻi is the parenthetical inclusion of the word "nutrients." Where waste is utilized as a resource, it is being used for the constituent components that provide benefit.

The NRCS Conservation Practice Standard 590, Nutrient Management, applies to commercial fertilizers, organic by-products, waste water, organic matter, and irrigation water. Nutrient management is the practice of managing the amount, rate, source, method of application, and timing of plant nutrients and soil amendments. The timing and application of nutrients will correspond with plant uptake, soil properties and weather conditions. For more information on nutrient balance management see Draft EIS Section 3.5.3, and Draft EIS Appendix D.

The effluent storage ponds are sized to accommodate 30 days of storage for up to 2,000 mature dairy cows, and over 85 days of storage for 699 mature dairy cows. It will be highly unlikely that the storage pond will be full at any time for the contemplated 2,000-cow dairy, and nearly impossible for the committed 699-cow dairy. Throughout the less than 30-day storage period, effluent is planned for application every four days, and the slurry application is expected at least once every 45 days, to ensure that the ponds are kept at manageable levels.

Cows lactate milk following the birth of calves. Newborn calves will be housed on the Māhāʻulepū site and provided essential colostrum and nutrients for a healthy start. During the calves' initial 90 days, they will be transitioned to pasture at HDF before transfer to ranches on Kauaʻi to be raised off-site. The committed herd size of

699 mature dairy cows at the Māhāʻulepū site applies to mature mature dairy cows. Animals in various stages of lactation and rest will be transferred between HDF and other partner ranches as needed for animal health and dairy productivity. This will benefit both the dairy and infuse the beef market in Hawaiʻi with a new, local source of pasture-raised calves. Male calves will become part of the beef cattle herd; heifers (young female calves that haven't given birth) will be raised until ready to return to the HDF herd as a birthing/mature dairy cow. For more information on off-site herd management, refer to Section 3.7 of the Draft EIS.

Health of the herd is of primary importance as the success of a dairy relies on cows effectively producing quality milk. All cows will be treated with a high standard of care. Dairy managers and caretakers will be trained and competent in handling animals to minimize stress and ensure the herds' welfare. A licensed veterinarian may prescribe use of antibiotics approved by the Food & Drug Administration (FDA) for treatment of illnesses. Adherence to guidelines that prohibit milk from cows undergoing antibiotic treatment will ensure no adulteration of milk. Routine laboratory tests of milk for traces of antibiotic residue will be conducted. HDF will not inject cows with bovine growth hormone, referred to as rBST or rBGH.

NOISE: Existing noise conditions of the project site and the surrounding Māhāʻulepū valley area are evaluated in the Draft Environmental Impact Statement (EIS), along with anticipated short-term and long-term noise conditions associated with the dairy farm and planned mitigation actions. Draft EIS Section 4.12 addresses noise conditions.

Noise can be defined as unwanted sound, a sound that is considered loud or unpleasant, and/or sound that causes disturbance. Research related to noise and livestock focuses on noise levels and minimization of unexpected sounds that cause undue stress on cows. Noise stress results in loss of livestock productivity and thereby financial loss to farmers and ranchers. Little research exists on the sound levels from livestock.

Sound is measured in decibels (dB). The State of Hawaiʻi Department of Health (DOH) rules use the A-weighting sound network (dBA) in the HAR §11-46, Community Noise Control. Sound through the air is similar to ripples on a pond of water. In open space without reflection, ripples spread uniformly in all directions and decrease in amplitude further from the source. In free field conditions such as outdoors, amplitude drops by half as distance doubles (OSHA, 2016). When sound passes close to absorbing ground cover such as grassland and fields, the "soft ground" absorbs extra sound as it passes. The Hawaiʻi Dairy Farms (HDF) site in Māhāʻulepū Valley is approximately 2 miles from the resort area, and 1.5 miles from the closest residential areas (on land zoned for agriculture). Typical noise currently generated near the HDF site includes truck ingress/egress along private farm roads, agricultural equipment, and cattle and sheep.

Construction work at the project site will involve activities that may generate an increase in noise levels. However, such exposures will be a short-term condition, occurring during daylight hours. Construction vehicles and activities must comply with DOH Administrative Rules. DOH noise control regulation requires a permit for

construction activities that emit noise in excess of 78 decibels or that cost a total of more than $250,000. Mitigation measures to minimize construction noise will include the use of mufflers to suppress loud equipment and limitations on the hours of heavy equipment operation.

The dairy farm will utilize milking equipment contained in the milking parlor, and will use field equipment such as tractors. Under HAR §11-46, agriculture is classified as Zoning District Class C, which specifies maximum permissible sound levels of 70 dBA in the daytime and 70 dBA at nighttime. Dairy operations will generate noise in keeping with agricultural zoning of the parcel. The primary noise receptors in the area would be farmers working nearby parcels. Noise from the dairy will not exceed the DOH threshold, and will not contribute to excessive noise in the region.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawaiʻi Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhāʻulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhāʻulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Poʻipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhāʻulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawaiʻi Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhāʻulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhāʻulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhāʻulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kauaʻi community.

Regional Water Demand: The adjacent, developed Kōloa-Poʻipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kauaʻi will increase county-wide by 17,300 residents by 2030. The South Kauaʻi population is estimated to reach 16,855 in 2035, when it is projected to

encompass 19.2 percent of the County population. For the South Kauaʻi region (the Kōloa - Poʻipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

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The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhāʻulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhāʻulepū watershed.

The HDF site is located on the bottom-land of the upper Māhāʻulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Haʻupu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhāʻulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kauaʻi Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhāʻulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhāʻulepū and adjacent watersheds. DOH conducted water sampling

within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhāʻulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three

times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Poʻipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring

program will be shared with the DOH CWB, dairy neighbors and the local Kaua'i community.

TRAFFIC: The Draft Environmental Impact Statement (EIS) Section 4.18 and 4.25 includes an evaluation of roadways and traffic conditions, along with potential impacts of the dairy farm construction and operation. Primary access to the site is via Māhā'ulepū Road, a two-way, two-lane road, which is accessible from Kōloa Road (Highway 530) via Ala Kinoiki Road. Within the project area, there is a network of unimproved private agriculture haul roads that provide access to and from Māhā'ulepū Road.

Roadways in the project area operate smoothly with no periods of heavy traffic. On average, traffic in the region is much lower than urban areas in the state due to the low population of Kaua'i and rural agricultural demographics of the south Kaua'i area and Māhā'ulepū. Traffic on Māhā'ulepū Road consists of agricultural vehicles, residential and resort visitor traffic.

During construction, the proposed project is not expected to have a significant short term impact on traffic operations in the project vicinity. Additional traffic will be generated during construction, but will return to normal levels after project completion during day-to-day operations. There will be no change to traffic patterns or infrastructure related to the public roads.

Traffic operations along Māhā'ulepū Road and the surrounding County roads are expected to continue to operate at acceptable levels of service during peak hours of traffic. The projected increase in vehicle movements related to HDF operations for the committed herd size of 699 cows would include 5 daily employees accessing the site, milk tanker and supply trucks every two days, and truck with stock trailer, for a total of 12 additional vehicle trips per day. Daily traffic along Ala Kinoiki Road and Kōloa Road was 8,000 and 6,500 cars daily; HDF-related traffic would add less than one percent additional trips. These additional trips would have a minimal effect on traffic conditions at County roadways in the surrounding area.

At a contemplated herd size of up to 2,000 cows, an additional 11 vehicle trips per day would access the HDF site, for a total of 23 vehicle trips daily. Projections for daily vehicle movements in 2035 for Ala Kinoiki Road and Kōloa Road are 7,200 and 9,500 daily vehicles. HDF-related traffic would add less than one percent. These additional trips would have a minimal effect on traffic conditions at County roadways in the surrounding area. Traffic data is presented in the Draft EIS Sections 4.18 and 4.24.

Construction equipment mobilization will comply with Hawai'i Department of Transportation and County requirements. Delivery trucks and milk tanker trucks will be in compliance with State and County size and weight limits; no oversized vehicles will be used for ongoing operations.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

From: Bill Barnard <b2seer@gmail.com>
Sent: Monday, February 09, 2015 10:04 AM
To: HDF
Cc: Bill Barnard
Subject: Hawaii Dairy Farms EIS Comment

Follow Up Flag: Follow up
Flag Status: Flagged

It seems that instead of learning from the failures of others this effort egotistically is trying to show that even though many have failed at the effort they seek, they will be the ones who succeed.

Sadly if this effort goes forward it will fail and it will take other good businesses with it.

I resent the implication that it will be a valid business in the face of failures in the past.

SO if you really believe it then post and escrow 5 billion dollars to compensate those who are going to have their life changed, residents in the area and downwind, this that have a business nearby and the hotel that will loose the visitors, the employees that will loose jobs, the loss of tax income for all of the county, thus burdening the people who use other service impacted by the loss of revenue and the increase in taxes possible for the county — things like stench, water pollution, and loss of business — and develop a list of the amounts that can be claimed when the problem is experienced.

And another 5 billion dollars to return the area to its current state.

No — then you do not believe that this project is correct for the masses just profitable of a few already comfortable people and a few people who really cannot get a real job, the marketers and the investment people

Bill Barnard
Kalaheo

GROUP 70 INTERNATIONAL

May 26, 2016

Bill Barnard
b2seer@gmail.com

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Bill Barnard:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

DEMOGRAPHIC AND ECONOMIC: The potential impacts of Hawai'i Dairy Farms (HDF) to the existing economy were evaluated in the Draft Environmental Impact Statement (EIS), including a fiscal impact assessment report completed in April, 2016 by Plasch Economics Pacific. Draft EIS Section 4.15 addresses demographic and economic factors, with the complete report in Appendix J.

The HDF project would create short-term benefits through jobs for local construction personnel and local material suppliers. Such jobs would include equipment operators, cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, supervisors, painters, etc. Based on State employment multipliers, indirect employment related to Dairy construction would be expected to average about 16 jobs on Kaua'i, and 8 on O'ahu. Construction employment would be expected to average about 12 jobs per year during the development period. Thus direct-plus-indirect employment association with

construction would be expected to average approximately 36 jobs, of which 28 would be on Kaua'i.

The HDF project would contribute to diversification of Kaua'i's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Hawai'i Island), approximately10 percent of Hawai'i's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and indirect full-time equivalent jobs on Kaua'i, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on O'ahu.

HDF is expected to generate a net income of approximately $68,000 to the County when the 699 cow herd is established. When the dairy has matured to full production for the 699 cow dairy, net income to the State is calculated at $160,000 annually. With the potential contemplated herd size of up to 2,000 mature dairy cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be produced. This would double local milk production currently supplied by operational dairies on the Island of Hawai'i.

Additional employment generated by a possible expansion to accommodate the contemplated 2,000 mature dairy cow herd is estimated at approximately 3 construction jobs plus 4 indirect jobs on Kaua'i, and 2 indirect jobs on O'ahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an additional 5 full-time farm jobs would be added, with approximately 15 additional indirect jobs on Kaua'i and another 8 indirect jobs on O'ahu.

The dairy is expected to generate a net additional contribution to the County of approximately $8,000 for improvements related to expansion for the contemplated herd size of up to 2,000 mature dairy cows ($76,000 total versus $68,000 for the committed herd size). The State will derive approximately $360,000 annually in revenues from the contemplated 2,000-mature dairy cow dairy.

Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

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The HDF site is located on the bottom-land of the upper Māhāʻulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Ha'upu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhāʻulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kaua'i Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhāʻulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhāʻulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhāʻulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top

of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Poʻipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kauaʻi community.

AIR QUALITY: As a part of the Environmental Impact Statement (EIS), existing air quality conditions and project impacts were evaluated, including dust and odor. Potential odors and emission levels for air pollutants relevant to dairy operations were modeled, as currently there are no cows on site. EIS sections 4.19 and 4.25 provide an evaluation of air quality and odors, including a windrose depicting wind speed and direction in the area (see DEIS Section 4.1, Climate). The full air quality technical report can be found in Draft EIS Appendix I.

Clean Air Act

Under the *Clean Air Act of 1970* (CAA), amended November 1990, the U.S. Environmental Protection Agency (EPA) regulates both large and small sources of air pollutants by establishing National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. The State of Hawaiʻi has established its own *State Ambient Air Quality Standards* (SAAQS) that are as strict or, in some cases more strict than the NAAQS. State standards prohibit any visible emissions of fugitive dust from construction activities at the property line.

Emissions relevant to livestock operation include particulate matter and fugitive dust. Greenhouse gases related to dairy cows include methane (CH_4) from enteric fermentation, and both methane and nitrous oxide (N_20) emissions from manure

application. No State or Federal regulations for greenhouse gas emissions from farm operations or small businesses currently exist.

DUST

Dust will be generated as cows move along soft limestone walkways that connect the paddocks and lead to and from the milking parlor. Potential fugitive dust emission rates were estimated from published literature, where particulate matter (PM) is measurable from the "drylots" of confined dairy operations where animals walk over dirt and dried manure throughout the day.

Applying the emission rates from this available literature greatly overestimates potential emission resulting from HDF. Cows in the pastoral rotational-grazing system will be on pasture 22 hours each day and will spend two hours – in two separate milking cycles –moving to and from the barn for the 10- to 15-minute milking sessions.

Using atmospheric dispersion modeling system (AERMOD), the rates were scaled to the size of the non-pasture areas used by cows at HDF. Results were added to the background concentration of particulate matter (both PM_{10} and $PM_{2.5}$) measured on the island of Kaua'i, and the total concentration was compared to the State ambient air quality standards. Only the contemplated herd size of up to 2,000 mature dairy cows was modeled, as at the lower threshold of 699 cows, the potential fugitive dust impact would be negligible. The estimated concentration for PM_{10} is 2.01 $\mu g/m^3$, well below the State standard of 150 $\mu g/m^3$. The estimated concentration for $PM_{2.5}$ is 0.23 $\mu g/m^3$, well below the Federal standard of 35 $\mu g/m^3$ (see Draft EIS Section 4.19 and Table 4-19.2).

ODOR

Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF, so air dispersion models were used to determine potential odor levels. Local weather data was used in conjunction with the AERMOD modeling system, and published rates for manure odors emissions for dairy heifers and effluent ponds were adapted to reflect the HDF facilities.

Odor emission sources identified for modeling at HDF were manure in the pasture fields, irrigation water containing diluted nutrients from effluent, the effluent storage ponds, and the dairy buildings. Odor rates from published research were applied. Odor isopleths (a line used to map all points having the same numerical value) were created to display the model findings. Odor is described in "odor units" at the threshold of perception, which is defined by the point at which 50 percent of panelists, in laboratory conditions, cannot smell the odor but 50 percent of the panelists can detect the odor.

Modeling results were generated for worst case meteorological conditions (low wind velocity / mixing). Generally, tradewinds will disperse odors to less than detectable levels beyond the HDF site; in periods of no wind, odor may not be

dispersed creating the "worst case" scenario. In these periods without normal tradewind flow, the odor plume would extend to the south of the HDF site. Sections 4.19.2 and 4.25.2 of the EIS include graphics of the potential odor isopleths.

Results for the committed herd size of 699 mature dairy cows show that odors may be detectable by 50 percent of the sensitive population once per 200 hours, or 44 hours per year, within an area that extends approximately 1,670-feet (within one-third of a mile) beyond the dairy farm boundary, and does not reach recreational or residential areas. Results for the contemplated expanded herd size of up to 2,000 mature dairy cows show odors would not extend beyond 2,780 feet outside the HDF boundary (just over half a mile), again not reaching recreational or residential areas, and again with detection limited to 50 percent of the sensitive population approximately 44 hours per year. The parameters used in the analysis were intentionally conservative, and the impacts shown assume an unlikely confluence of worst-case meteorological data, irrigation location, and grazing location. Actual offsite odor impacts are likely to be much lower and/or less frequent than shown; it is likely odor detection beyond the HDF boundaries will be less frequent.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

From: Bruce & Chris Baron [mailto:bbaron@cox.net]
Sent: Thursday, February 19, 2015 1:16 PM
To: EPO
Subject: Hawaii Dairy Farms Q and A...

One question asks why work is starting on the dairy now, prior to approval of the operation. Your answer is that HDF wants the dairy's grass to be ready when approval comes through. This sounds as if any hearings or public meetings are simply window dressing and that the Dairy is a done deal.

Chris Baron
1 Feathergrass
Irvine, CA 92604
Yearly visitor to Kauai

GROUP 70
INTERNATIONAL

May 26, 2016

Chris Baron
bbaron@cox.net

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Chris Baron:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

The following responses are offered to your comments:

Hawai'i Dairy Farms (HDF) is a privately funded project on privately owned land and does not meet any of the nine "triggers" as stated in Hawai'i Revised Statues Chapter 343, also known as the Hawai'i Environmental Policy Act. HDF is submitting an Environmental Impact Statement in order to show project information to address concerns expressed by the local community.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

Group 70 International • 925 Bethel Street, 5th Floor • Honolulu, HI 96813-4307 • tel. 808.523.5866 • fax. 808.523.5874 • www.group70int.com

Tom and Mary Bartlett
P.O. Box 826
Koloa, Kaua'i, HI 96756
808-652-0406

February 21, 2015

Laura McIntyre
Dept. of Health
State of Hawaii
1250 Punchbowl Street
Honolulu, HI 96813

Dear Ms. McIntyre:

As long time residents of the Koloa/Poipu area, we love and appreciate the beauty of this special place. There are many concerns we have about what changes the proposed industrial dairy (Hawaii Dairy Farms) site at Maha'ulepu will have on this fragile environment as follows:

1. Drinking water As the primary water source is from wells in close proximity to the dairy location, what is Hawaii Dairy Farms doing to **guarantee** that the quality of that source will not change, and that the county water department will not have to spend more to treat and guarantee the purity of that drinking water.

2. Air pollution With the odor and methane gas generated from the huge amount of manure and urine waste that will be created, what will the impact be to residents and visitors downwind (normal ENE trade winds)? What health impacts will there be to the people with certain breathing ailments?

3. Visitor industry impact As the Poipu area is a significant visitor destination that provides the community with thousands of jobs and considerable county, state, and federal revenues, should the visitor experience be compromised by the dairy operation to any degree? How will the residents who work in the visitor industry, and those who benefit from that income (grocery stores, restaurants, shops, etc.) be compensated should this compromise take place?

4. Property tax revenues HDF cannot guarantee that this industrial dairy will not have negative impacts on the environment. With the odor, air pollution, and water pollution created, property values will go down. With that, so will real property tax revenues.

5. Alternative sites There are many alternative sites that are more suitable for an industrial dairy operation that are further away from homes, businesses, resorts, the ocean, water wells, etc. HDF seems to be inflexible on this point.

6. Water consumption Kaua'i may be facing a water shortage. This industrial dairy operation will consume a very significant amount of water. Is this justifiable to the other important users of this precious commodity?

We are not opposed to a dairy operation, although an industrial dairy makes no practical sense on Kaua'i in our opinion. This is not "sustainable agriculture" for Kaua'i as the milk will have to be shipped off island for processing. Dairy operations on Oahu are the most logical solution since the milk is processed there. We are opposed though to the location they want to operate from. For the environmental damage this operation will cause the delicate Maha'ulepu area and the domino effect it will have on the residential and resort community, the risk is not worth the very few jobs it will provide.

We look forward to your responses to our concerns.

Sincerely,

Tom & Mary

Tom and Mary Bartlett

cc: Jeff Overton
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, HI 96813

Hawaii Dairy Farms, LLC
P.O. Box 1690
Koloa, HI 96756-1690

Hawai'i Dairy Farms
MAHA'ULEPU, KAUA'I

ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE

An Environmental Impact Statement (EIS) is being prepared voluntarily by the Applicant to assess potential environmental impacts and mitigation measures associated with agricultural operations at Hawai'i Dairy Farms (HDF) at Māhā'ulepū, Kaua'i.

To assist in preparing the EIS, an Environmental Impact Statement Preparation Notice (EISPN) was recently published. A 30-day public comment period on the EISPN ends February 23, 2015. The purposes of the publication and comment period are two-fold:

1. to allow individuals and groups to request to become a consulted party; and
2. to provide written comment regarding effects of the proposed action.

NOTE: Submitted comments will be published in the Draft EIS

COMMENT

Name: Tom Bartlett Organization:

Preferred contact Method

Email: Tom@MAKAIproperties.com Postal Address:

Phone: (Optional) 6520406

Comments: Isn't this about the GROVE FARM water rights?

Why does Pierre Omidyar want to hurt poor Koloa community?

We demand answers!

Return to:
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Attn: HDF Project
Honolulu, HI 96813
hdf@group70int.com

And/or:
Hawaii State Department of Health
Environmental Planning Office
919 Ala Moana Boulevard, Rm. 312
Honolulu, HI 96814
epo@doh.hawaii.gov

Deadline: February 23, 2015

Hawai'i Dairy Farms
MAHA'ULEPU, KAUA'I

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COMMENT

Name: Tom Bartlett Organization:

Preferred contact Method

Email: Tom@MAKAIproperties.com Postal Address:

Phone: (Optional) 6520406

Comments: Water –
drinking ~~water~~
* guarantee OUR drinking water quality due to well location
* guarantee county water dept won't have to pay more for insuring quality of water.
We demand an answer and correct solution.

Return to:
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Attn: HDF Project
Honolulu, HI 96813
hdf@group70int.com

And/or:
Hawaii State Department of Health
Environmental Planning Office
919 Ala Moana Boulevard, Rm. 312
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epo@doh.hawaii.gov

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NOTE: Submitted comments will be published in the Draft EIS

COMMENT

Name: TOM BARTLETT Organization:

Preferred contact Method

Email: Tom@MAKAIproperties.com Postal Address:

Phone: (Optional) 6520406

Comments: AIR quality
Critical to the Residents
and VISITORS. TAX base
CAN you guarantee AIR Quality?
We demand answers!
Too much at RISK.

Return to:
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Attn: HDF Project
Honolulu, HI 96813
hdf@group70int.com

And/or:
Hawaii State Department of Health
Environmental Planning Office
919 Ala Moana Boulevard, Rm. 312
Honolulu, HI 96814
epo@doh.hawaii.gov

Deadline: February 23, 2015

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2. to provide written comment regarding effects of the proposed action.

NOTE: Submitted comments will be published in the Draft EIS

COMMENT

Name: TOM BARTLETT Organization:

Preferred contact Method

Email: Tom@MAKAIproperties.com Postal Address:

Phone: (Optional) 6520406

Comments: ALT. LOCATION
FIND another area why so inflexible?
not opposed to dairy

Return to:
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Attn: HDF Project
Honolulu, HI 96813
hdf@group70int.com

And/or:
Hawaii State Department of Health
Environmental Planning Office
919 Ala Moana Boulevard, Rm. 312
Honolulu, HI 96814
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Deadline: February 23, 2015

Hawai'i Dairy Farms

MAHA'ULEPU, KAUA'I

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NOTE: Submitted comments will be published in the Draft EIS

COMMENT

Name: Tom Bartlett Organization:

Preferred contact Method

Email: Tom@makaiproperties.com Postal Address:

Phone: (Optional) 652-0406

Comments: Sustainability?
Shipping milk to Oahu.
Carbon footprint?
Grow and produce something more efficient!

Return to:
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Attn: HDF Project
Honolulu, HI 96813
hdf@group70int.com

And/or:
Hawaii State Department of Health
Environmental Planning Office
919 Ala Moana Boulevard, Rm. 312
Honolulu, HI 96814
epo@doh.hawaii.gov

Deadline: February 23, 2015

GROUP 70 INTERNATIONAL

May 26, 2016

Tom and Mary Bartlett
P.O. Box 826
Koloa, HI 96756
tom@makaiproperties.com

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Tom and Mary Bartlett:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

DEMOGRAPHIC AND ECONOMIC: The potential impacts of Hawai'i Dairy Farms (HDF) to the existing economy were evaluated in the Draft Environmental Impact Statement (EIS), including a fiscal impact assessment report completed in April, 2016 by Plasch Economics Pacific. Draft EIS Section 4.15 addresses demographic and economic factors, with the complete report in Appendix J.

The HDF project would create short-term benefits through jobs for local construction personnel and local material suppliers. Such jobs would include equipment operators, cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, supervisors, painters, etc. Based on State employment multipliers, indirect employment related to Dairy construction would be expected to average about 16 jobs on Kaua'i, and 8 on O'ahu. Construction

employment would be expected to average about 12 jobs per year during the development period. Thus direct-plus-indirect employment association with construction would be expected to average approximately 36 jobs, of which 28 would be on Kaua'i.

The HDF project would contribute to diversification of Kaua'i's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Hawai'i Island), approximately10 percent of Hawai'i's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and indirect full-time equivalent jobs on Kaua'i, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on O'ahu.

HDF is expected to generate a net income of approximately $68,000 to the County when the 699 cow herd is established. When the dairy has matured to full production for the 699 cow dairy, net income to the State is calculated at $160,000 annually. With the potential contemplated herd size of up to 2,000 mature dairy cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be produced. This would double local milk production currently supplied by operational dairies on the Island of Hawai'i.

Additional employment generated by a possible expansion to accommodate the contemplated 2,000 mature dairy cow herd is estimated at approximately 3 construction jobs plus 4 indirect jobs on Kaua'i, and 2 indirect jobs on O'ahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an additional 5 full-time farm jobs would be added, with approximately 15 additional indirect jobs on Kaua'i and another 8 indirect jobs on O'ahu.

The dairy is expected to generate a net additional contribution to the County of approximately $8,000 for improvements related to expansion for the contemplated herd size of up to 2,000 mature dairy cows ($76,000 total versus $68,000 for the committed herd size). The State will derive approximately $360,000 annually in revenues from the contemplated 2,000-mature dairy cow dairy.

Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E

and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhā'ulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhā'ulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Po'ipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhā'ulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawai'i Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhā'ulepū 14 well during the sugarcane

plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhāʻulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhāʻulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kauaʻi community.

Regional Water Demand: The adjacent, developed Kōloa-Poʻipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kauaʻi will increase county-wide by 17,300 residents by 2030. The South Kauaʻi population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kauaʻi region (the Kōloa - Poʻipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhāʻulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhāʻulepū watershed.

The HDF site is located on the bottom-land of the upper Māhāʻulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Haʻupu Ridge. These normally dry streams converge into man-made channels running

through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhāʻulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kauaʻi Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhāʻulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhāʻulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhāʻulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or

maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater

and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Poʻipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kauaʻi community.

TRAFFIC: The Draft Environmental Impact Statement (EIS) Section 4.18 and 4.25 includes an evaluation of roadways and traffic conditions, along with potential impacts of the dairy farm construction and operation. Primary access to the site is via Māhāʻulepū Road, a two-way, two-lane road, which is accessible from Kōloa Road (Highway 530) via Ala Kinoiki Road. Within the project area, there is a network of unimproved private agriculture haul roads that provide access to and from Māhāʻulepū Road.

Roadways in the project area operate smoothly with no periods of heavy traffic. On average, traffic in the region is much lower than urban areas in the state due to the low population of Kauaʻi and rural agricultural demographics of the south Kauaʻi area and Māhāʻulepū. Traffic on Māhāʻulepū Road consists of agricultural vehicles, residential and resort visitor traffic.

During construction, the proposed project is not expected to have a significant short term impact on traffic operations in the project vicinity. Additional traffic will be

generated during construction, but will return to normal levels after project completion during day-to-day operations. There will be no change to traffic patterns or infrastructure related to the public roads.

Traffic operations along Māhāʻulepū Road and the surrounding County roads are expected to continue to operate at acceptable levels of service during peak hours of traffic. The projected increase in vehicle movements related to HDF operations for the committed herd size of 699 cows would include 5 daily employees accessing the site, milk tanker and supply trucks every two days, and truck with stock trailer, for a total of 12 additional vehicle trips per day. Daily traffic along Ala Kinoiki Road and Kōloa Road was 8,000 and 6,500 cars daily; HDF-related traffic would add less than one percent additional trips. These additional trips would have a minimal effect on traffic conditions at County roadways in the surrounding area.

At a contemplated herd size of up to 2,000 cows, an additional 11 vehicle trips per day would access the HDF site, for a total of 23 vehicle trips daily. Projections for daily vehicle movements in 2035 for Ala Kinoiki Road and Kōloa Road are 7,200 and 9,500 daily vehicles. HDF-related traffic would add less than one percent. These additional trips would have a minimal effect on traffic conditions at County roadways in the surrounding area. Traffic data is presented in the Draft EIS Sections 4.18 and 4.24.

Construction equipment mobilization will comply with Hawaiʻi Department of Transportation and County requirements. Delivery trucks and milk tanker trucks will be in compliance with State and County size and weight limits; no oversized vehicles will be used for ongoing operations.

AIR QUALITY: As a part of the Environmental Impact Statement (EIS), existing air quality conditions and project impacts were evaluated, including dust and odor. Potential odors and emission levels for air pollutants relevant to dairy operations were modeled, as currently there are no cows on site. EIS sections 4.19 and 4.25 provide an evaluation of air quality and odors, including a windrose depicting wind speed and direction in the area (see DEIS Section 4.1, Climate). The full air quality technical report can be found in Draft EIS Appendix I.

Clean Air Act

Under the *Clean Air Act of 1970* (CAA), amended November 1990, the U.S. Environmental Protection Agency (EPA) regulates both large and small sources of air pollutants by establishing National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. The State of Hawaiʻi has established its own *State Ambient Air Quality Standards* (SAAQS) that are as strict or, in some cases more strict than the NAAQS. State standards prohibit any visible emissions of fugitive dust from construction activities at the property line.

Emissions relevant to livestock operation include particulate matter and fugitive dust. Greenhouse gases related to dairy cows include methane (CH_4) from enteric

fermentation, and both methane and nitrous oxide (N_20) emissions from manure application. No State or Federal regulations for greenhouse gas emissions from farm operations or small businesses currently exist.

DUST

Dust will be generated as cows move along soft limestone walkways that connect the paddocks and lead to and from the milking parlor. Potential fugitive dust emission rates were estimated from published literature, where particulate matter (PM) is measurable from the "drylots" of confined dairy operations where animals walk over dirt and dried manure throughout the day.

Applying the emission rates from this available literature greatly overestimates potential emission resulting from HDF. Cows in the pastoral rotational-grazing system will be on pasture 22 hours each day and will spend two hours – in two separate milking cycles –moving to and from the barn for the 10- to 15-minute milking sessions.

Using atmospheric dispersion modeling system (AERMOD), the rates were scaled to the size of the non-pasture areas used by cows at HDF. Results were added to the background concentration of particulate matter (both PM_{10} and $PM_{2.5}$) measured on the island of Kauaʻi, and the total concentration was compared to the State ambient air quality standards. Only the contemplated herd size of up to 2,000 mature dairy cows was modeled, as at the lower threshold of 699 cows, the potential fugitive dust impact would be negligible. The estimated concentration for PM_{10} is 2.01 $\mu g/m^3$, well below the State standard of 150 $\mu g/m^3$. The estimated concentration for $PM_{2.5}$ is 0.23 $\mu g/m^3$, well below the Federal standard of 35 $\mu g/m^3$ (see Draft EIS Section 4.19 and Table 4-19.2).

ODOR

Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF, so air dispersion models were used to determine potential odor levels. Local weather data was used in conjunction with the AERMOD modeling system, and published rates for manure odors emissions for dairy heifers and effluent ponds were adapted to reflect the HDF facilities.

Odor emission sources identified for modeling at HDF were manure in the pasture fields, irrigation water containing diluted nutrients from effluent, the effluent storage ponds, and the dairy buildings. Odor rates from published research were applied. Odor isopleths (a line used to map all points having the same numerical value) were created to display the model findings. Odor is described in "odor units" at the threshold of perception, which is defined by the point at which 50 percent of panelists, in laboratory conditions, cannot smell the odor but 50 percent of the panelists can detect the odor.

Modeling results were generated for worst case meteorological conditions (low wind velocity / mixing). Generally, tradewinds will disperse odors to less than

detectable levels beyond the HDF site; in periods of no wind, odor may not be dispersed creating the "worst case" scenario. In these periods without normal tradewind flow, the odor plume would extend to the south of the HDF site. Sections 4.19.2 and 4.25.2 of the EIS include graphics of the potential odor isopleths.

Results for the committed herd size of 699 mature dairy cows show that odors may be detectable by 50 percent of the sensitive population once per 200 hours, or 44 hours per year, within an area that extends approximately 1,670-feet (within one-third of a mile) beyond the dairy farm boundary, and does not reach recreational or residential areas. Results for the contemplated expanded herd size of up to 2,000 mature dairy cows show odors would not extend beyond 2,780 feet outside the HDF boundary (just over half a mile), again not reaching recreational or residential areas, and again with detection limited to 50 percent of the sensitive population approximately 44 hours per year. The parameters used in the analysis were intentionally conservative, and the impacts shown assume an unlikely confluence of worst-case meteorological data, irrigation location, and grazing location. Actual offsite odor impacts are likely to be much lower and/or less frequent than shown; it is likely odor detection beyond the HDF boundaries will be less frequent.

ALTERNATIVES: As a part of the DEIS, alternatives were evaluated that could attain the objectives of the action's purpose and need, and were compared with environmental benefits, costs, and risks of each reasonable alternative against those of the proposed dairy project. Further discussion of alternatives can be found in DEIS Section 6.

The DEIS evaluates alternatives that could attain the objectives of the action's purpose and need, and compares environmental benefits, costs, and risks of each reasonable alternative against those of the proposed action. Additionally, reasonable land use alternatives that emerged from public input during the project scoping phase are documented and briefly discussed. The alternatives that do not meet the project purpose are not advanced for analysis of environmental benefits, costs, and risks. The Environmental Impact Statement Rules, Hawai'i Administrative Rules Chapter 11-200 (HRS 11-200) requires a discussion of alternatives that could attain the objectives of the action, regardless of cost. There is no requirement for the alternatives analysis to consider every possible land use.

Four possible land uses that would not meet the project purpose are discussed. Rezoning the land for resort or residential development, or a potential conservation condemnation are two uses that were examined and eliminated from analysis. These options would not be reasonably viable given the existing private land tenure and existing zoning. Two additional alternatives were considered as reasonable land uses as they could be permitted within the existing State Land Use Agricultural District and County Agricultural Zoning District. These options include Agricultural Park with Processing Center, and development of an Agricultural Subdivision. The alternatives were examined and eliminated from further analysis, however, as they would not fulfill the project purpose.

The analysis, therefore, focuses on alternatives that meet the project purpose. Rigorous exploration and evaluation of the environmental impacts of the

alternatives, including those that might enhance environmental quality or avoid, reduce or minimize some or all of the adverse environmental effects, costs and risks. These alternatives include: (1) the development of a Conventional Feedlot Dairy (a non-pasture-based dairy) at the same location; (2) development of the Pasture-Based Dairy at an Alternative Location on Kaua'i; and (3) milk products processing by HDF. The alternative of "No Action" is also evaluated.

The alternatives analysis provides a comprehensive evaluation of the range of potential alternatives, including the two alternative development scenarios. Although the alternatives are potentially reasonable uses under existing zoning and neighboring uses, each fails to comprehensively fulfill the project requirements defined by the eight Project Objectives and the four established Evaluation Criteria (Chapter 2, Sections 2.3.3 and 2.3.4).

The essential differences as compared to the proposed action are highlighted in the following statements.

- Only one of the alternative actions (conventional feedlot alternative) would create a commercial scale dairy operation in Hawai'i, with the capability to produce 10 percent of the State's fresh milk demand thus reducing dependence on imported milk (Objective 1). This alternative, however, would not reduce reliance on costly imported fertilizer and feed (Objective 2); grow local, quality grass as a primary feedstock (Objective 3); and would not utilize 100 percent of manure on site as nutrients to grow forage for dairy cows (Criterion 4).
- None of the alternatives would secure a dairy location that meets the requirements for a pastoral, pasture-based grazing dairy: sufficient contiguous land area; available long-term land tenure; adequate potable water supply; suitable soil properties; gentle slope conditions; and accessibility (Criterion 1).
- One alternative (Agricultural Park) could potentially generate new long-term employment in the agricultural sector on Kaua'i in a wide range of positions including pasture agronomy/soils science, environmental resources management (Criterion 2).
- The Agricultural Park alternative could also develop sustainable food production utilizing Important Agricultural Lands, demonstrating the importance of long-term agricultural leases and capital investment for agricultural infrastructure, water systems and support facilities. (Criterion 3). However, after years of trying, it appears there was limited interest in such a venture.
- Finally, addressing the range of potential environmental impacts (natural, cultural, social and economic) (Objective 8) the two alternative development scenarios would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.

In contrast to the other options considered, the planned agricultural operation of Hawai'i Dairy Farms, was determined to be the most viable option and is the preferred alternative. Of all the alternatives considered, this is the only approach

that achieves project objectives and meets each of the four Evaluation Criteria.

- Hawai'i Dairy Farms will create a commercial scale pasture-based dairy operation in Hawai'i, with the capability to provide more than 1,000,000 gallons of the fresh milk demand, reducing dependence on imported milk (Objective 1).
- The planned dairy location meets the requirements of minimum land area, soil properties, slope conditions, water supply, land tenure and availability, and accessibility (Criterion 1).
- The planned action will generate new long-term employment in the agricultural sector on Kaua'i, including pasture agronomy/soils science, veterinary and animal husbandry, environmental resources management, milk/milk processing, and dairy business management (Criterion 2).
- Sustainable food production utilizing Important Agricultural Lands (Criterion 3) will occur with the proposed action, demonstrating the importance of long term agricultural leases, and the ability to draw capital investment for agricultural infrastructure including water systems and support facilities (Criterion 3).
- Address the range of potential environmental impacts by utilizing 100 percent of manure as natural fertilizer to grow the majority of food for cows (Criterion 4). The alternatives evaluated would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.
- Creating an economically viable pasture rotational-grazing model maintains agriculture, retains open space, and provides buffer between highly utilized resort and residential development and sensitive natural or cultural resources (Objective 8).

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

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RECEIVED
FEB 27 2015
GROUP 70 INTL

February 23, 2015

Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, HI 96813

Re: Kauai Dairy Proposal

To Whom It May Concern:

My wife and I own residential property in Poipu. We intend to live there full-time in the coming years.

We strongly urge a thorough EIR of the proposal of dairy farming in the Mahaulepu area. The following issues need to be addressed:

1. The irrevocable loss or destruction of natural and cultural resources;
2. The impact of massive amounts of animal waste on the land, water table and ocean;
3. Conflicts the proposal has with the State's long term environmental policies and goals;
4. Detrimental affects on scenic vistas and view planes;
5. Destruction of protected animal and plant species;
6. The affect on traffic and transportation; and
7. The detrimental impact of the odor that will be created and disseminated by wind.

I am sure there are many others.

Please notify me of any public hearings on the matter. You may contact me directly at:

J. Jude Basile
Deidre O'Connor Basile
6404 Buckley Drive
Cambria, CA 934

Very truly yours,

Jude Basile

J. Jude Basile
JJB:cr

May 26, 2016

Jude Basile
6404 Buckley Dr.
Cambria, CA 93428
jude@basilelaw.com

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Jude Basile:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

LAND USE: The historical and existing land uses of the project site and surrounding Māhā'ulepū Valley were examined in the Draft Environmental Impact Statement (EIS), and uses proposed by the Hawai'i Dairy Farms (HDF) project were evaluated in the context of county and state land use designations for the area. The evaluation of land use is presented in Draft EIS Chapter 4.4, and the project's consistency with government plans and policies is presented in Draft EIS Chapter 5.0.

The south shore of Kaua'i is home to some of the most productive farm land in the state, attributed to consistent sunshine, ample fresh water, and a large amount of Class A and B soils (with "A" representing the class of highest productivity soils and "E" representing the lowest). The large tracts of farmland, including those of Mahaulepu Farm and Grove Farm, allow for stability in support of farm ventures,

help maintain regional water systems and provide agricultural employment for Kaua'i residents in addition to fresh, local food.

The project site is on agricultural land in Māhā'ulepū Valley, an area with a long history of agricultural use as it was the first place in the island chain where sugarcane was commercially grown. The site is in the Agricultural District per State Land Use District designations, and per the County of Kaua'i zoning ordinance. The site consists of land classified as Prime per the State Department of Agriculture's Agricultural Lands of Importance to the State of Hawai'i (ALISH). The HDF site is outside of the County-designated Special Management Area under the Coastal Zone Management Program.

In 2005, the State established Important Agricultural Lands (IAL) by statute. The purpose of IAL is to conserve and protect agricultural lands, promote diversified agriculture, increase agricultural self-sufficiency and assure the availability of agriculturally suitable lands. The designation process determines land meet physical requirements including contiguous, functional land units large enough to allow flexibility in agricultural production near appropriate infrastructure and water, with high quality soil agricultural productivity ratings under the Land Study Bureau of University of Hawai'i.

In 2011, Mahaulepu Farm LLC filed a petition with the State of Hawai'i Land Use Commission to designate 1,533 acres of agricultural lands in Māhā'ulepū (including 557 acres that make up the HDF site) as IAL. IAL designation meets the objectives of the State HRS §205-42 by contributing to the maintenance of a strategic agricultural land resource base to support a diversity of agricultural activities and opportunities that expand agricultural income and job opportunities. See Figure 4.4-2 in DEIS Section 4.4.

The designation process determined that the land meets a number of physical requirements established in HRS §205-45, including contiguous, functional land units large enough to allow flexibility in agricultural production near appropriate infrastructure and water, with 88.5 percent of the area featuring an overall soil agricultural productivity rating of "B" per criteria established by the Land Study Bureau of University of Hawai'i.

The development and long-term operation of HDF will be in full compliance with its agricultural State Land Use District designation, ALISH classifications, and County zoning. The dairy farm will embody the intent of the IAL designation per the Hawai'i State Constitution, by using these protected lands for the intended purpose of diversified agriculture, food production and agricultural self-sufficiency. HDF development of a dairy also supports the "secondary intent" for lands in the Agriculture land designation, to provide an opportunity for Kaua'i citizens to reside in an agricultural community. This is in contrast to the described "agricultural subdivisions" that have changed parts of Kaua'i intended for a rural landscape, with development as quasi-suburban landscapes dotted with residences on large lots.

Overall, the project provides long-term benefit and support of agricultural lands and industry through continued use in keeping with zoning and IAL designation. Long-

term operation of the dairy does not preclude the region for future protection in a coastal park at Māhāʻulepū.

VISUAL RESOURCES: The Draft Environmental Impact Statement (EIS) addresses the existing visual and aesthetic resources of the dairy site, and the potential impacts of Hawaiʻi Dairy Farms. Draft EIS Section 4.5 addresses potential effects to public scenic views.

The County of Kauaʻi General Plan identifies the HDF site as agricultural land in a region consisting of open space, parks, and conservation lands in the mountains and along the coast. The important visual landforms identified in the surrounding region are Puʻu Hunihuni Crater to the southwest, the scenic roadway corridor of Ala Kinoiki Road, and the Hāʻupu Mountains that surround the project area to the northeast. However, the majority of the project area has gentle topography, with no evident physical features standing out within this broad agricultural valley.

The dairy site is not visible from public vantage points along public roadways and areas along the coastline. Vegetation and topography screen public views of the Māhāʻulepū Valley lowlands. Dairy farm structures will conform to County height limits for agricultural zoned land. The tallest structures of the Hawaiʻi Dairy Farms facilities will include the milking parlor and the associated storage tanks, all of which are roughly 33 feet in height. These items are in keeping with the agricultural character of the area, and would be expected to have minimal to no impact on public views of the Puʻu Hunihuni crater, views from the Ala Kinoiki Road corridor, or the views of the Hāʻupu Mountains surrounding the project.

ARCHAEOLOGICAL AND CULTURAL: The Hawaiʻi Dairy Farms (HDF) project is subject to a historic preservation review by the State Department of Land and Natural Resources, State Historic Preservation Division (SHPD) under HRS Chapter 6E and Chapter 13-284. An Archaeological Inventory Survey (AIS) and a Cultural Impact Assessment (CIA) were conducted by Scientific Consultant Services (SCS) for the proposed project. EIS Sections 4.7 and 4.8 provide an evaluation of archaeology and cultural resources, with technical studies in Appendix G and H.

A total of sixteen historic properties were identified through a pedestrian survey of the project area and an extended survey area of 100 meters of the northern boundary. Six historic-era sites occur in the project area and 10 sites occur in the extended survey area. Only one of the sites is believed to be associated with pre-Contact and/or early historic times. State Site 50-30-10-2250, the agricultural heiau, and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area. The remaining sites consist of historic-era bridges, ditches, culverts, retaining walls, and a flume system dating from the 20th century and are affiliated with sugarcane cultivation.

That a majority of the documented sites are related to the historic-era is not surprising, given the massive landscape modifications that occurred during intensive sugarcane cultivation on the valley floor. Even historic era cultural materials associated with the many Land Commission Awards in the project area were non-existent, as explored through survey and subsurface exploration.

The sixteen historic properties have been assessed for significance by the archaeological consultant and the dairy project is anticipated to have no impact on these sites. No further archaeological work is recommended for the sites. Two of the sixteen sites are considered significant under multiple criteria, but occur outside the project area on lands owned by a different landowner. Both sites will not be adversely affected by the proposed dairy project. No site is related to burials, and no bonex were found. Such sites have been reported along coastal areas in sand dunes.

The cultural assessment examined the potential effect of the project on cultural resources, practices or beliefs, its potential to isolate cultural resources, practices or beliefs from their setting, and the potential of the project to introduce elements which may alter the setting in which cultural practices take place. Information received from the community indicates the Māhāʻulepū Ahupuaʻa, has been and is currently used for traditional cultural purposes. However, the dairy project area has not been included in these activities. It is clear that the gathered plants, trails, State Site 50-30-10-2250, the agricultural heiau, and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area.

The project will be fully enclosed by perimeter fencing along the boundary of the leased premises, which will ensure that project activities and any related impacts are contained within the project area. Based on the research and comments received from the community, it is reasonable to conclude that, pursuant to Act 50, the exercise of native Hawaiian rights or any ethnic group related to numerous traditional cultural practices will not be impacted by establishment of the dairy.

FLORA AND FAUNA: Botanical, avian, and mammalian surveys of the property were conducted for the Draft Environmental Impact Statement (EIS) to assess existing species on site, including identifying any species listed as endangered, threatened, or proposed under any state or federal endangered species programs in or near the property. EIS Sections 4.9 and 4.10 address the evaluation of flora and fauna resources, with technical studies in Appendix A and B.

A botanical survey of the dairy property was conducted in August 2014 by AECOS Consulting to assess existing plant species. The survey also investigated for the presence of plants currently listed as endangered, threatened or proposed for listing under Federal or the State of Hawaiʻi's endangered species programs, located onsite or within the immediate vicinity of the dairy site. The nature of the land and its present and historical uses for intensive agriculture very much limit the natural botanical resources anticipated to occur on this land. Complete species lists are included in the EIS, and no protected botanical species occur on the project property. The project will include vegetated buffer strips along the drainage ways as part of the Conservation Plan to reduce erosion and stabilize slopes. Where native plants occur or could survive if planted, native plants will be used in the stabilization. No long-term impacts to native plant habitats or endangered or threatened plants species will occur as a result of the dairy.

Avian and mammalian surveys were conducted in August 2014 by Rana Biological Consulting, Inc. This survey was conducted to assess the potential presence of avian or mammalian species currently listed as endangered, threatened or proposed for

listing under either Federal or the State endangered species lists. The survey covered the dairy site area and immediate vicinity. Common birds and terrestrial mammals were encountered on the property. There is no critical habitat for endangered species in the upper Māhāʻulepū Valley.

Four species of endangered waterbirds were recorded on the site and at the nearby taro farm located within the HDF site. Though the area does not provide critical habitat, seabirds that nest in upland areas of Kauai may overfly the site. The endangered Hawaiian goose, nēnē was also seen on the site. State Division of Forestry and Wildlife biologists have noted nēnē are regularly seen on the subject property. It is probable that some nest on or adjacent to the site as this species nests in the general Kōloa area, and the habitat present on parts of the site is suitable for nēnē nesting.

The principal potential impacts posed to the five endangered species include those potentially associated with construction activities, and those associated with dairy farm operations following build-out. Measures will be adopted to avoid potential seabird and nēnē goose collisions with fences and structures. Potential measures include lowering construction cranes at night, using conservation fencing to project-specified areas, marking tall structures and fencing with white visibility polytape, limiting nighttime lighting, and shading any outside lights used at night. Ongoing mitigation strategies will be implemented for day-to-day preventative measures, including an Avian Species Protection Plan. Mitigation measures are further described in DEIS Section 4.10.2.

It is also likely that Hawaiian hoary bats overfly the project area on a seasonal basis. While caution will be taken during any potential disturbance or vegetation removal, there are almost no suitable roost trees within the dairy site, thus it is expected that the dairy farm will not affect this listed mammalian species.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawaiʻi Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhāʻulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhāʻulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Poʻipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhāʻulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawaiʻi Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhāʻulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhāʻulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhāʻulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no

animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kaua'i community.

Regional Water Demand: The adjacent, developed Kōloa-Po'ipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kaua'i will increase county-wide by 17,300 residents by 2030. The South Kaua'i population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kaua'i region (the Kōloa - Po'ipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhā'ulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhā'ulepū watershed.

The HDF site is located on the bottom-land of the upper Māhā'ulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Ha'upu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhā'ulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed

in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kaua'i Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhā'ulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhā'ulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhā'ulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected

from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Poʻipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment

which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kauaʻi community.

AIR QUALITY: As a part of the Environmental Impact Statement (EIS), existing air quality conditions and project impacts were evaluated, including dust and odor. Potential odors and emission levels for air pollutants relevant to dairy operations were modeled, as currently there are no cows on site. EIS sections 4.19 and 4.25 provide an evaluation of air quality and odors, including a windrose depicting wind speed and direction in the area (see DEIS Section 4.1, Climate). The full air quality technical report can be found in Draft EIS Appendix I.

Clean Air Act

Under the *Clean Air Act of 1970* (CAA), amended November 1990, the U.S. Environmental Protection Agency (EPA) regulates both large and small sources of air pollutants by establishing National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. The State of Hawaiʻi has established its own *State Ambient Air Quality Standards* (SAAQS) that are as strict or, in some cases more strict than the NAAQS. State standards prohibit any visible emissions of fugitive dust from construction activities at the property line.

Emissions relevant to livestock operation include particulate matter and fugitive dust. Greenhouse gases related to dairy cows include methane (CH_4) from enteric fermentation, and both methane and nitrous oxide (N_20) emissions from manure application. No State or Federal regulations for greenhouse gas emissions from farm operations or small businesses currently exist.

DUST

Dust will be generated as cows move along soft limestone walkways that connect the paddocks and lead to and from the milking parlor. Potential fugitive dust

emission rates were estimated from published literature, where particulate matter (PM) is measurable from the "drylots" of confined dairy operations where animals walk over dirt and dried manure throughout the day.

Applying the emission rates from this available literature greatly overestimates potential emission resulting from HDF. Cows in the pastoral rotational-grazing system will be on pasture 22 hours each day and will spend two hours – in two separate milking cycles –moving to and from the barn for the 10- to 15-minute milking sessions.

Using atmospheric dispersion modeling system (AERMOD), the rates were scaled to the size of the non-pasture areas used by cows at HDF. Results were added to the background concentration of particulate matter (both PM_{10} and $PM_{2.5}$) measured on the island of Kaua'i, and the total concentration was compared to the State ambient air quality standards. Only the contemplated herd size of up to 2,000 mature dairy cows was modeled, as at the lower threshold of 699 cows, the potential fugitive dust impact would be negligible. The estimated concentration for PM_{10} is 2.01 $\mu g/m^3$, well below the State standard of 150 $\mu g/m^3$. The estimated concentration for $PM_{2.5}$ is 0.23 $\mu g/m^3$, well below the Federal standard of 35 $\mu g/m^3$ (see Draft EIS Section 4.19 and Table 4-19.2).

ODOR

Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF, so air dispersion models were used to determine potential odor levels. Local weather data was used in conjunction with the AERMOD modeling system, and published rates for manure odors emissions for dairy heifers and effluent ponds were adapted to reflect the HDF facilities.

Odor emission sources identified for modeling at HDF were manure in the pasture fields, irrigation water containing diluted nutrients from effluent, the effluent storage ponds, and the dairy buildings. Odor rates from published research were applied. Odor isopleths (a line used to map all points having the same numerical value) were created to display the model findings. Odor is described in "odor units" at the threshold of perception, which is defined by the point at which 50 percent of panelists, in laboratory conditions, cannot smell the odor but 50 percent of the panelists can detect the odor.

Modeling results were generated for worst case meteorological conditions (low wind velocity / mixing). Generally, tradewinds will disperse odors to less than detectable levels beyond the HDF site; in periods of no wind, odor may not be dispersed creating the "worst case" scenario. In these periods without normal tradewind flow, the odor plume would extend to the south of the HDF site. Sections 4.19.2 and 4.25.2 of the EIS include graphics of the potential odor isopleths.

Results for the committed herd size of 699 mature dairy cows show that odors may be detectable by 50 percent of the sensitive population once per 200 hours, or 44 hours per year, within an area that extends approximately 1,670-feet (within one-

third of a mile) beyond the dairy farm boundary, and does not reach recreational or residential areas. Results for the contemplated expanded herd size of up to 2,000 mature dairy cows show odors would not extend beyond 2,780 feet outside the HDF boundary (just over half a mile), again not reaching recreational or residential areas, and again with detection limited to 50 percent of the sensitive population approximately 44 hours per year. The parameters used in the analysis were intentionally conservative, and the impacts shown assume an unlikely confluence of worst-case meteorological data, irrigation location, and grazing location. Actual offsite odor impacts are likely to be much lower and/or less frequent than shown; it is likely odor detection beyond the HDF boundaries will be less frequent.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

From: Sabra Basler [mailto:sabra.basler@gmail.com]
Sent: Sunday, February 22, 2015 7:59 PM
To: EPO; Julie Hagensen; Cornelia Boyle; bridgethammerquist@hawaiiantel.net
Subject: kauai dairy proposal

Aloha Reader

Well this proposal for the dairy in Kauai runs the gambit ....from a ploy to turn the land area designated important ag lands into a resort area and undesignate it as ag area, to a total disregard of the sea (and land and land users in Poipu) to maybe a real attempt at improving sustainability.

My concerns are if it were truly sustainable why not lead the world and make it organic dairy. It is beyond my understanding how those with resources to do so would not.... but each man has his own consciousness so be it. Pierre, you have a right to create a non organic dairy, But you do not have the right to pollute the land, the sea and affect the growth and reproductive health of endangers sea turtles, whales and monk seals in the area, and affect the reproductive health of the fishes used for subsistence of many islanders in the Pacific

Even if organic many concerns would arise, but since not organic my concerns magnify with cow excretion (or nutrients as they call it) not only containing nitrogen related compounds that create dead zones in trun off areas of the sea BUT ...Growth hormones, the Milk Production encouraging pharmacologicals, antibiotics, and other pesticides, herbicides, and endocrine disrupting substances could reek havoc on this island community ecosystems .. growth hormones for young whales, seals turtles and reef fish ... perhaps larger fishes such as marlin and sail fish ..... how will the dairy change their DNA this needs to be studied, documented and .... traffic and roads ...more study needed. If a resort .....its already the Kalaheo crawl .... then lets sit down and really talk about it and not play games.

Please please please look at the substances ingested by these cows and then discarded into the sea via their excrement and run off or drifting. Not all these substances will be absorbed by the land and used as a fertilizer to feed the bovine population. Much of it will wind up in the sea. do base line studies of BGH, hormone altering- related substances, nitrates, etc after the dumping of waste issues are cleared up in the area and do this right

Please What a wonderful opportunity to do something right. Dear Pierre .....Please consider going organic and creating processing plant here so the milk is good for the island of Kauai and its people. EIS researchers consider BGH and other hormones and endocrine altering substances that will be used and their affects on the sea and all who live, dive, die, fish and enjoy that sea and the endangered species for which we are guardians.

Mahalo

Sabra Basler
Kalaheo,Kauai
Waiohai swimmer
Paddler
diver

--
Sabra Basler

GROUP 70 INTERNATIONAL

May 26, 2016

Sabra Basler
Kalaheo, Kauai
sabra.basler@gmail.com

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Sabra Basler:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

LAND USE: The historical and existing land uses of the project site and surrounding Māhā'ulepū Valley were examined in the Draft Environmental Impact Statement (EIS), and uses proposed by the Hawai'i Dairy Farms (HDF) project were evaluated in the context of county and state land use designations for the area. The evaluation of land use is presented in Draft EIS Chapter 4.4, and the project's consistency with government plans and policies is presented in Draft EIS Chapter 5.0.

The south shore of Kaua'i is home to some of the most productive farm land in the state, attributed to consistent sunshine, ample fresh water, and a large amount of Class A and B soils (with "A" representing the class of highest productivity soils and "E" representing the lowest). The large tracts of farmland, including those of Mahaulepu Farm and Grove Farm, allow for stability in support of farm ventures,

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help maintain regional water systems and provide agricultural employment for Kaua'i residents in addition to fresh, local food.

The project site is on agricultural land in Māhā'ulepū Valley, an area with a long history of agricultural use as it was the first place in the island chain where sugarcane was commercially grown. The site is in the Agricultural District per State Land Use District designations, and per the County of Kaua'i zoning ordinance. The site consists of land classified as Prime per the State Department of Agriculture's Agricultural Lands of Importance to the State of Hawai'i (ALISH). The HDF site is outside of the County-designated Special Management Area under the Coastal Zone Management Program.

In 2005, the State established Important Agricultural Lands (IAL) by statute. The purpose of IAL is to conserve and protect agricultural lands, promote diversified agriculture, increase agricultural self-sufficiency and assure the availability of agriculturally suitable lands. The designation process determines land meet physical requirements including contiguous, functional land units large enough to allow flexibility in agricultural production near appropriate infrastructure and water, with high quality soil agricultural productivity ratings under the Land Study Bureau of University of Hawai'i.

In 2011, Mahaulepu Farm LLC filed a petition with the State of Hawai'i Land Use Commission to designate 1,533 acres of agricultural lands in Māhā'ulepū (including 557 acres that make up the HDF site) as IAL. IAL designation meets the objectives of the State HRS §205-42 by contributing to the maintenance of a strategic agricultural land resource base to support a diversity of agricultural activities and opportunities that expand agricultural income and job opportunities. See Figure 4.4-2 in DEIS Section 4.4.

The designation process determined that the land meets a number of physical requirements established in HRS §205-45, including contiguous, functional land units large enough to allow flexibility in agricultural production near appropriate infrastructure and water, with 88.5 percent of the area featuring an overall soil agricultural productivity rating of "B" per criteria established by the Land Study Bureau of University of Hawai'i.

The development and long-term operation of HDF will be in full compliance with its agricultural State Land Use District designation, ALISH classifications, and County zoning. The dairy farm will embody the intent of the IAL designation per the Hawai'i State Constitution, by using these protected lands for the intended purpose of diversified agriculture, food production and agricultural self-sufficiency. HDF development of a dairy also supports the "secondary intent" for lands in the Agriculture land designation, to provide an opportunity for Kaua'i citizens to reside in an agricultural community. This is in contrast to the described "agricultural subdivisions" that have changed parts of Kaua'i intended for a rural landscape, with development as quasi-suburban landscapes dotted with residences on large lots.

Overall, the project provides long-term benefit and support of agricultural lands and industry through continued use in keeping with zoning and IAL designation. Long-

term operation of the dairy does not preclude the region for future protection in a coastal park at Māhā'ulepū.

FLORA AND FAUNA: Botanical, avian, and mammalian surveys of the property were conducted for the Draft Environmental Impact Statement (EIS) to assess existing species on site, including identifying any species listed as endangered, threatened, or proposed under any state or federal endangered species programs in or near the property. EIS Sections 4.9 and 4.10 address the evaluation of flora and fauna resources, with technical studies in Appendix A and B.

A botanical survey of the dairy property was conducted in August 2014 by AECOS Consulting to assess existing plant species. The survey also investigated for the presence of plants currently listed as endangered, threatened or proposed for listing under Federal or the State of Hawai'i's endangered species programs, located onsite or within the immediate vicinity of the dairy site. The nature of the land and its present and historical uses for intensive agriculture very much limit the natural botanical resources anticipated to occur on this land. Complete species lists are included in the EIS, and no protected botanical species occur on the project property. The project will include vegetated buffer strips along the drainage ways as part of the Conservation Plan to reduce erosion and stabilize slopes. Where native plants occur or could survive if planted, native plants will be used in the stabilization. No long-term impacts to native plant habitats or endangered or threatened plants species will occur as a result of the dairy.

Avian and mammalian surveys were conducted in August 2014 by Rana Biological Consulting, Inc. This survey was conducted to assess the potential presence of avian or mammalian species currently listed as endangered, threatened or proposed for listing under either Federal or the State endangered species lists. The survey covered the dairy site area and immediate vicinity. Common birds and terrestrial mammals were encountered on the property. There is no critical habitat for endangered species in the upper Māhā'ulepū Valley.

Four species of endangered waterbirds were recorded on the site and at the nearby taro farm located within the HDF site. Though the area does not provide critical habitat, seabirds that nest in upland areas of Kauai may overfly the site. The endangered Hawaiian goose, nēnē was also seen on the site. State Division of Forestry and Wildlife biologists have noted nēnē are regularly seen on the subject property. It is probable that some nest on or adjacent to the site as this species nests in the general Kōloa area, and the habitat present on parts of the site is suitable for nēnē nesting.

The principal potential impacts posed to the five endangered species include those potentially associated with construction activities, and those associated with dairy farm operations following build-out. Measures will be adopted to avoid potential seabird and nēnē goose collisions with fences and structures. Potential measures include lowering construction cranes at night, using conservation fencing to project-specified areas, marking tall structures and fencing with white visibility polytape, limiting nighttime lighting, and shading any outside lights used at night. Ongoing mitigation strategies will be implemented for day-to-day preventative measures,

including an Avian Species Protection Plan. Mitigation measures are further described in DEIS Section 4.10.2.

It is also likely that Hawaiian hoary bats overfly the project area on a seasonal basis. While caution will be taken during any potential disturbance or vegetation removal, there are almost no suitable roost trees within the dairy site, thus it is expected that the dairy farm will not affect this listed mammalian species.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhā'ulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhā'ulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Po'ipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhā'ulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered

volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawai'i Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhā'ulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhā'ulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhā'ulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kaua'i community.

Regional Water Demand: The adjacent, developed Kōloa-Po'ipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kaua'i will increase county-wide by 17,300 residents by 2030. The South Kaua'i population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kaua'i region (the Kōloa - Po'ipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well

water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhāʻulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhāʻulepū watershed.

The HDF site is located on the bottom-land of the upper Māhāʻulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Haʻupu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhāʻulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kauaʻi Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhāʻulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhāʻulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs

from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhāʻulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Poʻipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kauaʻi community.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawaiʻi Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

Bonnie P. Bator
PO Box 30848
Anahola, Hawai`i 96703-0848

10 February 2015

Attention:
Virginia Pressler, MD, Director
State of Hawaii, Department of Health (DOH)
1250 Punchbowl Street
Honolulu, Hawai`i 96813

Laura McIntyre, Environmental Planner
Environmental Planning Office
919 Ala Moana Blvd – Room 312
Honolulu, Hawai`i 96814

Consultant: Jeff Overton, Principal Planner
Group 70 International, Inc.
925 Bethel Street, 5th Floor, Honolulu, Hawai`i 96813

RE: Proposal by Hawaii Dairy Farms LLC (HDF) to construct a commercial dairy facility at Maha`ulepu, Kaua`i.

Dear Dr. Pressler, Ms McIntyre of the State of Hawaii, Department of Health (DOH)
And Group 70 International, Inc. And To Whom It May Concern:

Aloha! I appreciate the opportunity to comment on the proposed commercial dairy at Maha`ulepu, by Hawaii Dairy Farms LLC.

Please deny Hawaii Dairy Farms LLC Environmental Impact Statement; on grounds of countless and myriad environmental impacts of destruction at Maha`ulepu – should this debacle be allowed. Catastrophic, irreparable damage to the `aina, reef, sea life, ocean water quality and et cetera; warrants rejection of this proposal.

I want to become a consulted party to receive the Draft Environmental Impact Statement (dEIS).

At the very least, if Hawaii Dairy Farms LLC; desires to proceed on this proposed fiasco of a commercial dairy at Maha`ulepu – a Federal Environmental Impact Statement – would provide a more extensive and unbiased environmental scrutiny; than the State of Hawaii Environmental Impact Statement process.

That Hawaii Dairy Farms LLC is preparing its own Environmental Impact Statement; paying *Group 70 International, Inc.* to prepare the EIS; is likened to: "The fox guarding the henhouse".

The magnitude of the significance of Maha`ulepu, with Makawehi carbon dated at six million years – is priceless beyond comprehension; and allowing a commercial dairy there is sacrilegious!

Mahalo for your collective common sense! If Hawaii Dairy Farms LLC really wants to construct a dairy – do it elsewhere… NOT at Maha`ulepu.

I look forward to receive a copy of the dEIS – Mahalo for your valuable time and consideration in this matter.

Sincerely with *ALOHA*,
Bonnie P. Bator
Bonnie P. Bator and `Ohana

GROUP 70 INTERNATIONAL

May 26, 2016

Bonnie P. Bator
PO Box 30848
Anahola, HI 96703-0848

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Bonnie P. Bator:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

GROUP 70 OBJECTIVITY: Group 70 International, Inc. (Group 70) is responsible for the preparation and processing of the Hawai'i Dairy Farms Environmental Impact Statement (EIS). The EIS was prepared in accordance with the requirements of Chapter 343 Hawai'i Revised Statutes and the "Environmental Impact Statement Rules" (Chapter 200 of Title 11, Hawai'i Administrative Rules). The environmental planning team at Group 70 has prepared several hundred Environmental Assessment and EIS documents over the past 40 years, and every document has been accepted by the responsible County, State and Federal agency. On numerous past EIS projects, the Hawai'i Chapter of the American Planning Association has recognized Group 70's professional work with Chapter awards for excellence in environmental planning. Part of the EIS scoping process involves Group 70's experienced team of technical sub consultants that are well-known and qualified in

their respective fields of study. For this project, Group 70 is preparing the Hawai'i Dairy Farms EIS with the level of analysis required to properly evaluate and disclose the existing environmental conditions, probable impacts with mitigation, and potential cumulative and secondary effects.

FLORA AND FAUNA: Botanical, avian, and mammalian surveys of the property were conducted for the Draft Environmental Impact Statement (EIS) to assess existing species on site, including identifying any species listed as endangered, threatened, or proposed under any state or federal endangered species programs in or near the property. EIS Sections 4.9 and 4.10 address the evaluation of flora and fauna resources, with technical studies in Appendix A and B.

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limiting nighttime lighting, and shading any outside lights used at night. Ongoing mitigation strategies will be implemented for day-to-day preventative measures, including an Avian Species Protection Plan. Mitigation measures are further described in DEIS Section 4.10.2.

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WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

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SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhā'ulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhā'ulepū watershed.

The HDF site is located on the bottom-land of the upper Māhā'ulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Ha'upu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhā'ulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kaua'i Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhā'ulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhā'ulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could

be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhāʻulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Poʻipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kauaʻi community.

ALTERNATIVES: As a part of the DEIS, alternatives were evaluated that could attain the objectives of the action's purpose and need, and were compared with environmental benefits, costs, and risks of each reasonable alternative against those of the proposed dairy project. Further discussion of alternatives can be found in DEIS Section 6.

The DEIS evaluates alternatives that could attain the objectives of the action's purpose and need, and compares environmental benefits, costs, and risks of each reasonable alternative against those of the proposed action. Additionally, reasonable land use alternatives that emerged from public input during the project scoping phase are documented and briefly discussed. The alternatives that do not meet the project purpose are not advanced for analysis of environmental benefits, costs, and risks. The Environmental Impact Statement Rules, Hawai'i Administrative Rules Chapter 11-200 (HRS 11-200) requires a discussion of alternatives that could attain the objectives of the action, regardless of cost. There is no requirement for the alternatives analysis to consider every possible land use.

Four possible land uses that would not meet the project purpose are discussed. Rezoning the land for resort or residential development, or a potential conservation condemnation are two uses that were examined and eliminated from analysis. These options would not be reasonably viable given the existing private land tenure and existing zoning. Two additional alternatives were considered as reasonable land uses as they could be permitted within the existing State Land Use Agricultural District and County Agricultural Zoning District. These options include Agricultural Park with Processing Center, and development of an Agricultural Subdivision. The alternatives were examined and eliminated from further analysis, however, as they would not fulfill the project purpose.

The analysis, therefore, focuses on alternatives that meet the project purpose. Rigorous exploration and evaluation of the environmental impacts of the alternatives, including those that might enhance environmental quality or avoid, reduce or minimize some or all of the adverse environmental effects, costs and risks. These alternatives include: (1) the development of a Conventional Feedlot Dairy (a non-pasture-based dairy) at the same location; (2) development of the Pasture-Based Dairy at an Alternative Location on Kaua'i; and (3) milk products processing by HDF. The alternative of "No Action" is also evaluated.

The alternatives analysis provides a comprehensive evaluation of the range of potential alternatives, including the two alternative development scenarios. Although the alternatives are potentially reasonable uses under existing zoning and neighboring uses, each fails to comprehensively fulfill the project requirements defined by the eight Project Objectives and the four established Evaluation Criteria (Chapter 2, Sections 2.3.3 and 2.3.4).

The essential differences as compared to the proposed action are highlighted in the following statements.

- Only one of the alternative actions (conventional feedlot alternative) would create a commercial scale dairy operation in Hawai'i, with the capability to produce 10 percent of the State's fresh milk demand thus reducing dependence on imported milk (Objective 1). This alternative, however, would not reduce reliance on costly imported fertilizer and feed (Objective 2); grow local, quality grass as a primary feedstock (Objective 3); and would not utilize 100 percent of manure on site as nutrients to grow forage for dairy cows (Criterion 4).
- None of the alternatives would secure a dairy location that meets the requirements for a pastoral, pasture-based grazing dairy: sufficient contiguous land area; available long-term land tenure; adequate potable water supply; suitable soil properties; gentle slope conditions; and accessibility (Criterion 1).
- One alternative (Agricultural Park) could potentially generate new long-term employment in the agricultural sector on Kaua'i in a wide range of positions including pasture agronomy/soils science, environmental resources management (Criterion 2).
- The Agricultural Park alternative could also develop sustainable food production utilizing Important Agricultural Lands, demonstrating the importance of long-term agricultural leases and capital investment for agricultural infrastructure, water systems and support facilities. (Criterion 3). However, after years of trying, it appears there was limited interest in such a venture.
- Finally, addressing the range of potential environmental impacts (natural, cultural, social and economic) (Objective 8) the two alternative development scenarios would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.

In contrast to the other options considered, the planned agricultural operation of Hawai'i Dairy Farms, was determined to be the most viable option and is the preferred alternative. Of all the alternatives considered, this is the only approach that achieves project objectives and meets each of the four Evaluation Criteria.

- Hawai'i Dairy Farms will create a commercial scale pasture-based dairy operation in Hawai'i, with the capability to provide more than 1,000,000 gallons of the fresh milk demand, reducing dependence on imported milk (Objective 1).
- The planned dairy location meets the requirements of minimum land area, soil properties, slope conditions, water supply, land tenure and availability, and accessibility (Criterion 1).
- The planned action will generate new long-term employment in the agricultural sector on Kaua'i, including pasture agronomy/soils science, veterinary and animal husbandry, environmental resources management, milk/milk processing, and dairy business management (Criterion 2).

- Sustainable food production utilizing Important Agricultural Lands (Criterion 3) will occur with the proposed action, demonstrating the importance of long term agricultural leases, and the ability to draw capital investment for agricultural infrastructure including water systems and support facilities (Criterion 3).
- Address the range of potential environmental impacts by utilizing 100 percent of manure as natural fertilizer to grow the majority of food for cows (Criterion 4). The alternatives evaluated would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.
- Creating an economically viable pasture rotational-grazing model maintains agriculture, retains open space, and provides buffer between highly utilized resort and residential development and sensitive natural or cultural resources (Objective 8).

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

RECEIVED
FEB 23 2015
GROUP 70 INTL

February 18, 2015

Group 70 International
925 Bethel Street, 5th Floor
Honolulu, HI 96813-4307
Attention: Planning Consultant, Jeffrey H. Overton, Principal Planner
(EDF@Group70int.com)

State of Hawai'i Department of Health
Envrionmental Planning Office
919 Ala Moana Boulevard, Room 312
Honolulu, HI 96814
Attention: Laura McIntyre, Program Manager
(laura.McIntyre@doh.hawaii.gov)

Subject: Opposition to Hawai'i Dairy Farms in Kaua'i/Koloa District

Dear Jeffrey and Laura,

Thank you for Jeffrey's January 21 letter regarding the Hawai'i Dairy Farms. We appreciate the opportunity to participate in the environmental review process by providing our comments of opposition to you, postmarked before February 22.

How inappropriate to allow a large industrial scale dairy in the proposed location in Koloa District on the island of Kaua'i because, if approved, this massive dairy farm would threaten:
- rich native Hawai'ian cultural practices
- archeological sites
- a fragile environmental ecosystem home to endangered and threatened plant and animal life
- the south shore residents and tourist's health and well being due to the volume of toxic waste (manure and urine) deposited and pumped onto pastures so close to the county wells providing drinking water for all of Poi'pu and much of Kola
- the economic damage to the south shore as tourism

Please do the right thing by weighing the consequences and considering not only the near-term negative impacts but future impacts for generations to come. We hope you conclude as we have to NOT SUPPORT Hawai'i Dairy Farms. You can keep us informed, address our concerns and/or reach us via email at kauaibaycondo@gmail.com.

Thank you.

Greg & Shelley Bay

Greg & Shelley Bay
Poi'pu Sands owners
kauaibaycondo@gmail.com

May 26, 2016

Greg & Shelley Bay
kauaibaycondo@gmail.com

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Greg & Shelley Bay:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

ARCHAEOLOGICAL AND CULTURAL: The Hawai'i Dairy Farms (HDF) project is subject to a historic preservation review by the State Department of Land and Natural Resources, State Historic Preservation Division (SHPD) under HRS Chapter 6E and Chapter 13-284. An Archaeological Inventory Survey (AIS) and a Cultural Impact Assessment (CIA) were conducted by Scientific Consultant Services (SCS) for the proposed project. EIS Sections 4.7 and 4.8 provide an evaluation of archaeology and cultural resources, with technical studies in Appendix G and H.

A total of sixteen historic properties were identified through a pedestrian survey of the project area and an extended survey area of 100 meters of the northern boundary. Six historic-era sites occur in the project area and 10 sites occur in the extended survey area. Only one of the sites is believed to be associated with pre-Contact and/or early historic times. State Site 50-30-10-2250, the agricultural heiau, and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of

the project area. The remaining sites consist of historic-era bridges, ditches, culverts, retaining walls, and a flume system dating from the 20th century and are affiliated with sugarcane cultivation.

That a majority of the documented sites are related to the historic-era is not surprising, given the massive landscape modifications that occurred during intensive sugarcane cultivation on the valley floor. Even historic era cultural materials associated with the many Land Commission Awards in the project area were non-existent, as explored through survey and subsurface exploration.

The sixteen historic properties have been assessed for significance by the archaeological consultant and the dairy project is anticipated to have no impact on these sites. No further archaeological work is recommended for the sites. Two of the sixteen sites are considered significant under multiple criteria, but occur outside the project area on lands owned by a different landowner. Both sites will not be adversely affected by the proposed dairy project. No site is related to burials, and no bonex were found. Such sites have been reported along coastal areas in sand dunes.

The cultural assessment examined the potential effect of the project on cultural resources, practices or beliefs, its potential to isolate cultural resources, practices or beliefs from their setting, and the potential of the project to introduce elements which may alter the setting in which cultural practices take place. Information received from the community indicates the Māhā'ulepū Ahupua'a, has been and is currently used for traditional cultural purposes. However, the dairy project area has not been included in these activities. It is clear that the gathered plants, trails, State Site 50-30-10-2250, the agricultural heiau, and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area.

The project will be fully enclosed by perimeter fencing along the boundary of the leased premises, which will ensure that project activities and any related impacts are contained within the project area. Based on the research and comments received from the community, it is reasonable to conclude that, pursuant to Act 50, the exercise of native Hawaiian rights or any ethnic group related to numerous traditional cultural practices will not be impacted by establishment of the dairy.

FLORA AND FAUNA: Botanical, avian, and mammalian surveys of the property were conducted for the Draft Environmental Impact Statement (EIS) to assess existing species on site, including identifying any species listed as endangered, threatened, or proposed under any state or federal endangered species programs in or near the property. EIS Sections 4.9 and 4.10 address the evaluation of flora and fauna resources, with technical studies in Appendix A and B.

A botanical survey of the dairy property was conducted in August 2014 by AECOS Consulting to assess existing plant species. The survey also investigated for the presence of plants currently listed as endangered, threatened or proposed for listing under Federal or the State of Hawai'i's endangered species programs, located onsite or within the immediate vicinity of the dairy site. The nature of the land and its present and historical uses for intensive agriculture very much limit the natural botanical resources anticipated to occur on this land. Complete species lists are

included in the EIS, and no protected botanical species occur on the project property. The project will include vegetated buffer strips along the drainage ways as part of the Conservation Plan to reduce erosion and stabilize slopes. Where native plants occur or could survive if planted, native plants will be used in the stabilization. No long-term impacts to native plant habitats or endangered or threatened plants species will occur as a result of the dairy.

Avian and mammalian surveys were conducted in August 2014 by Rana Biological Consulting, Inc. This survey was conducted to assess the potential presence of avian or mammalian species currently listed as endangered, threatened or proposed for listing under either Federal or the State endangered species lists. The survey covered the dairy site area and immediate vicinity. Common birds and terrestrial mammals were encountered on the property. There is no critical habitat for endangered species in the upper Māhāʻulepū Valley.

Four species of endangered waterbirds were recorded on the site and at the nearby taro farm located within the HDF site. Though the area does not provide critical habitat, seabirds that nest in upland areas of Kauai may overfly the site. The endangered Hawaiian goose, nēnē was also seen on the site. State Division of Forestry and Wildlife biologists have noted nēnē are regularly seen on the subject property. It is probable that some nest on or adjacent to the site as this species nests in the general Kōloa area, and the habitat present on parts of the site is suitable for nēnē nesting.

The principal potential impacts posed to the five endangered species include those potentially associated with construction activities, and those associated with dairy farm operations following build-out. Measures will be adopted to avoid potential seabird and nēnē goose collisions with fences and structures. Potential measures include lowering construction cranes at night, using conservation fencing to project-specified areas, marking tall structures and fencing with white visibility polytape, limiting nighttime lighting, and shading any outside lights used at night. Ongoing mitigation strategies will be implemented for day-to-day preventative measures, including an Avian Species Protection Plan. Mitigation measures are further described in DEIS Section 4.10.2.

It is also likely that Hawaiian hoary bats overfly the project area on a seasonal basis. While caution will be taken during any potential disturbance or vegetation removal, there are almost no suitable roost trees within the dairy site, thus it is expected that the dairy farm will not affect this listed mammalian species.

DEMOGRAPHIC AND ECONOMIC: The potential impacts of Hawai'i Dairy Farms (HDF) to the existing economy were evaluated in the Draft Environmental Impact Statement (EIS), including a fiscal impact assessment report completed in April, 2016 by Plasch Economics Pacific. Draft EIS Section 4.15 addresses demographic and economic factors, with the complete report in Appendix J.

The HDF project would create short-term benefits through jobs for local construction personnel and local material suppliers. Such jobs would include equipment operators, cement workers to lay foundations, metal workers,

carpenters, plumbers, electricians, roofers, supervisors, painters, etc. Based on State employment multipliers, indirect employment related to Dairy construction would be expected to average about 16 jobs on Kaua'i, and 8 on O'ahu. Construction employment would be expected to average about 12 jobs per year during the development period. Thus direct-plus-indirect employment association with construction would be expected to average approximately 36 jobs, of which 28 would be on Kaua'i.

The HDF project would contribute to diversification of Kaua'i's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Hawai'i Island), approximately10 percent of Hawai'i's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and indirect full-time equivalent jobs on Kaua'i, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on O'ahu.

HDF is expected to generate a net income of approximately $68,000 to the County when the 699 cow herd is established. When the dairy has matured to full production for the 699 cow dairy, net income to the State is calculated at $160,000 annually. With the potential contemplated herd size of up to 2,000 mature dairy cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be produced. This would double local milk production currently supplied by operational dairies on the Island of Hawai'i.

Additional employment generated by a possible expansion to accommodate the contemplated 2,000 mature dairy cow herd is estimated at approximately 3 construction jobs plus 4 indirect jobs on Kaua'i, and 2 indirect jobs on O'ahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an additional 5 full-time farm jobs would be added, with approximately 15 additional indirect jobs on Kaua'i and another 8 indirect jobs on O'ahu.

The dairy is expected to generate a net additional contribution to the County of approximately $8,000 for improvements related to expansion for the contemplated herd size of up to 2,000 mature dairy cows ($76,000 total versus $68,000 for the committed herd size). The State will derive approximately $360,000 annually in revenues from the contemplated 2,000-mature dairy cow dairy.

Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhā'ulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhā'ulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Po'ipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhā'ulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawai'i Department of Health Milk Rules require that potable water be used for milk production, both in the milking

parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhā'ulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhā'ulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhā'ulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kaua'i community.

Regional Water Demand: The adjacent, developed Kōloa-Po'ipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kaua'i will increase county-wide by 17,300 residents by 2030. The South Kaua'i population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kaua'i region (the Kōloa - Po'ipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhā'ulepū Surface

Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhāʻulepū watershed.

The HDF site is located on the bottom-land of the upper Māhāʻulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Haʻupu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhāʻulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kauaʻi Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhāʻulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhāʻulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhāʻulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Poʻipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kauaʻi community.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawaiʻi Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

FEB 25 2015

February 21, 2015

State of Hawaii
ATTN: Laura McIntyre
Department of Health
1250 Punchbowl Street
Honolulu, HI 96813

RE: Response to EIS for Hawaii Dairy Farms (HDF)

Aloha Ms. McIntyre,

Pertinent Points of Concern:

1) Property owners in Poipu area – property values and resale will be affected
2) We use the ocean for exercise classes and play
3) Effects of dairy on tourism
4) Published scientific documentation of negative effects of dairies on land, streams, ocean in New Zealand and various states on mainland USA
5) Hawaii Dairy Farms calls this project a "zero-discharge" endeavor – isn't that a misnomer?

The above items each need to be addressed in detail in Hawaii Dairy Farm's (HDF) EIS. Of particular importance is the noticeable short shrift given by HDF to economic and social consequences. Also, I am concerned that the EISPN does not sufficiently address alternative locations. It would seem that a genuine exploration of alternative locations should, at a minimum, consider three other sites which should be better developed and seriously explored by a qualified Environmental Engineering Firm familiar with Animal Feed Operations and the known impact they have on the environment.

We are homeowners and year-round residents in Poipu, Kauai, residing a short distance from the Grand Hyatt Hotel to the east and Poipu Beach Park to the west. We've been living on Kauai for twenty-eight years and in the Poipu area since 1997. We moved to Kauai from the mainland because we were drawn to the climate, water (ocean and rivers), slower pace of life, friendly people and the feeling of a community that truly cared about preserving all of its natural resources. As long as we've been living here there has been a very active group who have aggressively advocated maintaining Mahaulepu Beach and Valley called Malama Mahaulepu, indicating that that area is very special in many ways.

While we're not against Island sustainability, we don't think that it should be attained at the expense of our protected (so far) natural resources and healthy way of life. Many professional people, Southshore residents and businesses have expressed their concerns regarding the implementation of an industrial dairy in a pristine and culturally important valley that is located very near one of Kauai's top tourist destinations and upwind to those businesses and residences alike.

We are concerned about the odors and biting flies that would definitely come our way most of the year as we are in the tradewind path that comes from the Mahaulepu direction. What is Hawaii Dairy Farms (HDF) going to do to keep that from driving the tourists and homeowners away from the Poipu area? The Grand Hyatt Hotel and many of the condominium resorts are bound to lose business. Residents may choose to move away and will have a difficult time selling.

I teach water classes and my husband surfs in the ocean at Poipu Beach. What is Hawaii Dairy Farms (HDF) going to do to guarantee that they won't add to the pollution to an already polluted stream,

Waiopili, running through the valley property down to the ocean, thus raising levels of contamination that will kill the reefs and marine life and make the ocean inhospitable for humans to exercise and play in? Like the tradewinds the ocean currents flow from Mahaulepu toward Shipwreck Beach in front of the Grand Hyatt Hotel and on down to Poipu Beach.

At the first meeting that Hawaii Dairy Farms (HDF) hosted in February 2014 at the Koloa Neighborhood Center for the Southshore community, we were informed that HDF was basing their dairy farm on the New Zealand method of dairy farming. It has been scientifically proven and publicized that the New Zealand method has greatly polluted the streams and ocean thus forcing New Zealand to spend millions (or more) dollars taking many years to try to clean it up – a work in progress that has yet to be accomplished. Why does HDF insist on having an industrial dairy in one of the most inappropriate locations on Kauai for this sort of business? Is HDF prepared to be spending millions (or billions) of dollars over the years cleaning up after themselves when the water, land and air have been compromised due to the "normal" operations of such an endeavor?

Wouldn't it be intelligent of Grove Farm, Hawaii Dairy Farms and Ulupono Initiative principals to be proactive and avoid all those problems from the outset by putting their dairy in another more appropriate location on Kauai?

We respectfully submit this letter with heavy hearts.

Sincerely,

Allan and Charlotte Beall

Allan and Charlotte Beall
1641 Makanui Road
Poipu, HI 96756
(808) 742-2487
iamabeall@cs.com

RETURN RECEIPT REQUESTED

GROUP 70
INTERNATIONAL

May 26, 2016

Charlotte and Allen Beall
1641 Makanui Road
Poipu, HI 96756
iamabeall@cs.com

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Charlotte and Allen Beall:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

DAIRY OPERATIONS: Hawai'i Dairy Farms (HDF) will establish and operate a sustainable, pastoral rotational-grazing dairy farm in Māhā'ulepū Valley on the island of Kaua'i to produce fresh, locally available nutritious milk for Hawai'i families. The rotational-grazing method utilizes 100 percent of the cows' manure as natural fertilizer to grow pasture grass as a primary source of nutrition for dairy cows. This cost-effective method will reduce reliance on imported fertilizer and feed. Pasture grass will comprise at least 70 percent of the animals' diet. As a part of the Draft Environmental Impact Statement (EIS), the proposed facilities and operations for the dairy farm are described in Chapter 3.

The Environmental Impact Statement (EIS) Preparation Notice (EISPN), published January 23, 2015, described the proposed pasture-based rotational grazing system

as a "zero-discharge, grass-fed dairy". The term "zero-discharge" under the U.S. Environmental Protection Agency related to concentrated feeding operations (CAFO) is a system designed to not discharge pollutants into waters of the United States. As noted previously, the HDF system is designed to utilize 100 percent of the cows' manure on-site. However, nutrients would be introduced to the HDF site with any use; the Draft EIS identifies the amount of nutrients anticipated from the proposed dairy operations that could pass through to ground and surface waters. Therefore, HDF elected to discontinue use of the term "zero discharge" as it was construed as no nutrients into the system.

The term "grass-fed" was used in the HDF EISPN. This term was used to identify HDF's intent to utilize a locally-produced feedstock – grass – for more than 70 percent of the dairy herds' diet. In January 2016, the U.S. Department of Agricultural (USDA) Marketing Survey created a narrow legal definition of "grass-fed". The USDA standard defines what animals can and cannot be fed. The Food Alliance, a project of several northwest colleges, believes that when consumers choose grass-fed products there is an expectation that these will come from animals raised on pasture on a forage-based diet. Due to the evolving definition of "grass-fed", the term in not used in this EIS.

The dairy facilities will occupy an area of approximately 10 acres on the western boundary of the site. The developed area "footprint" will be less than 2 percent of the total farm area. Four buildings will be constructed to serve different functions, supported by utilities and infrastructure. Additional building information can be found in Draft EIS Section 3.3.1.

Agricultural infrastructure and utilities required for the dairy operations will include storage tanks and silos, effluent storage ponds, livestock water systems, and drainage improvements. The irrigation system and distribution of livestock water are discussed in Draft EIS Section 3.5, Pasture Management.

The pastoral rotational-grazing dairy provides a local feedstock – grass – as the herd's primary food source. Reducing imported feed stabilizes costs and provides a food source closer to the natural diet of cows. Results of grass trials initially conducted at five sites across four Hawaiian Islands were instrumental in identifying appropriate varieties of grass, and suitable sites to support sufficient "dry matter" grass yields essential to a cow's diet. Additional project-specific trials at the Māhā'ulepū site on Kauai have been conducted for more than 18 months. The results have identified sufficient yield and nutrition to supply 70 percent of the cows' diet; improvements in grass productivity are anticipated to provide up to 85 percent of cows' diet.

The pasture-based model allows cows to move about freely, and to lie down and rest, which is part of the digestion cycle. The animals are managed in social groups known as "mobs", mimicking the natural social order of bovines. Cows spend 22 hours of each 24-hour period foraging on pasture or resting, outdoors in natural light and fresh air. The gently sloped paddocks, walkways and races minimize the energy expended by the mature dairy cows as they graze or are transferred to and from the various paddocks and the mature dairy facility; surfaces of the walkways

and cow races are designed to provide a comfortable path under hoof. The management practices and pasture model applied by HDF maximizes grass as the cows' primary nutrition source and minimizes stress to the animals. Cows tend to be healthier and live longer, productive lives with access to fresh air, high quality feed, and exercise while they forage.

The 470 acres of pasture will be divided into paddocks averaging 3 to 5 acres in size. Smaller paddocks located near the dairy facility will be used as temporary pasture for cows or calves being moved on or off the farm. To protect the water quality of surface water and downstream areas, paddock fences are set back 35 feet from the edge of drainage ways throughout the site. Existing vegetation within the setbacks will be managed or restored to reduce erosion, improve stability of ditch banks, increase net carbon storage, and improve and maintain water quality.

The majority of the pastures will be irrigated with non-potable water and/or diluted effluent through either the pivot irrigation systems or through gun irrigators. Irrigation water supply is provided to the farm from Waita Reservoir, and will be filtered and pumped to the various irrigation components on the farm. The irrigation system is controlled using computer software and GPS receivers to allow very precise application of irrigation and/or diluted effluent on the pasture. The pivots can rotate and apply irrigation water and/or diluted effluent at different rates depending on the actual irrigation needs of the farm.

NRCS provides technical guidance on applying agricultural waste depending on the desired use of the waste. Reflected in the title of the livestock waste guidance for Hawai'i is the parenthetical inclusion of the word "nutrients." Where waste is utilized as a resource, it is being used for the constituent components that provide benefit.

The NRCS Conservation Practice Standard 590, Nutrient Management, applies to commercial fertilizers, organic by-products, waste water, organic matter, and irrigation water. Nutrient management is the practice of managing the amount, rate, source, method of application, and timing of plant nutrients and soil amendments. The timing and application of nutrients will correspond with plant uptake, soil properties and weather conditions. For more information on nutrient balance management see Draft EIS Section 3.5.3, and Draft EIS Appendix D.

The effluent storage ponds are sized to accommodate 30 days of storage for up to 2,000 mature dairy cows, and over 85 days of storage for 699 mature dairy cows. It will be highly unlikely that the storage pond will be full at any time for the contemplated 2,000-cow dairy, and nearly impossible for the committed 699-cow dairy. Throughout the less than 30-day storage period, effluent is planned for application every four days, and the slurry application is expected at least once every 45 days, to ensure that the ponds are kept at manageable levels.

Cows lactate milk following the birth of calves. Newborn calves will be housed on the Māhā'ulepū site and provided essential colostrum and nutrients for a healthy start. During the calves' initial 90 days, they will be transitioned to pasture at HDF before transfer to ranches on Kaua'i to be raised off-site. The committed herd size of

699 mature dairy cows at the Māhā'ulepū site applies to mature mature dairy cows. Animals in various stages of lactation and rest will be transferred between HDF and other partner ranches as needed for animal health and dairy productivity. This will benefit both the dairy and infuse the beef market in Hawai'i with a new, local source of pasture-raised calves. Male calves will become part of the beef cattle herd; heifers (young female calves that haven't given birth) will be raised until ready to return to the HDF herd as a birthing/mature dairy cow. For more information on off-site herd management, refer to Section 3.7 of the Draft EIS.

Health of the herd is of primary importance as the success of a dairy relies on cows effectively producing quality milk. All cows will be treated with a high standard of care. Dairy managers and caretakers will be trained and competent in handling animals to minimize stress and ensure the herds' welfare. A licensed veterinarian may prescribe use of antibiotics approved by the Food & Drug Administration (FDA) for treatment of illnesses. Adherence to guidelines that prohibit milk from cows undergoing antibiotic treatment will ensure no adulteration of milk. Routine laboratory tests of milk for traces of antibiotic residue will be conducted. HDF will not inject cows with bovine growth hormone, referred to as rBST or rBGH.

PESTS: A study of invertebrate species and pest insects was conducted by Steven Lee Montgomery, PhD, Consulting Biologist in January 2016. The study summarizes the presence or absence of native species or pest species associated with cattle manure in the general Māhā'ulepū area, as well as the parasites and predators that control those species. No federally or state listed endangered or threatened invertebrate species were noted in the survey of the site. A full report and list of species found on site is provided in EIS Section 4.11 and Appendix B.

Flies were identified on the HDF site using manure from neighboring livestock as bait for invertebrates. The two flies associated with livestock are the stable fly and the horn fly, the latter known for biting cattle. These flies and the greenbottle fly are often confused with the house fly. Flies known to exist on Kaua'i but not seen at the HDF site include the house fly, the dog dung fly, and the chicken dung fly. These pests are common in areas with high pet populations. It is possible these fly species could inadvertently be brought to the dairy and utilize manure as a food source. HDF will prevent and control fly population growth through diligent clean up and sanitation practices regarding any trash and food waste, as well as through efficient manure composting practices. A full list of site management measures is provided in EIS Section 4.11. The project location does not provide any habitat for *drosophila musaphilia*, the only Kaua'i species of native Hawaiian fly listed as Endangered or Threatened. Native Drosophila habitat is located many miles away in the high elevation koa-'ōhi'a forests.

Fly populations at HDF will be minimized through a process known as Integrated Pest Management (IPM). Essentially, IPM disrupts reproduction with appropriate means at key points in the pest's life cycle. Used in Hawai'i for decades, a number of invertebrates and a bird (the cattle egret) were introduced between 1898 and 1950 to reduce livestock-related insects. IPM utilizes knowledge of the ancient food web among species.

An especially important insect to minimize fly breeding habitat in manure is the dung beetle, which buries manure and incorporates it into the soil. Populations of dung beetles found on Kaua'i and those species already in Māhā'ulepū Valley, will increase with the increased manure food source, thus increasing and speeding breakdown of manure. Dung beetles are specialists in the very important natural process of breaking up and quickly recycling bovine manure pads. The behavioral diversity among dung beetle species will work together to bury dung pats in one to three days, a shorter amount of time than the 10-30 days flies eggs need to hatch.

In the Kōloa-Po'ipū region, pest fly populations are dependent upon food and breeding sources nearby such as dog, cat, and chicken feces. Beef cattle graze in the region on agricultural lands along Ala Kinoiki Road between Kōloa and Po'ipū, and it is likely the livestock-related flies identified at the HDF site occur in this region as well. Localized controls to reduce pest populations need to address breeding sites in and amongst the food and animals wastes within the area. These mitigation measures will make it difficult for flies to breed, and BMPs will be enforced to address any increase in population, therefore it is expected that the dairy farm will not significantly affect recreational and resort areas.

DEMOGRAPHIC AND ECONOMIC: The potential impacts of Hawai'i Dairy Farms (HDF) to the existing economy were evaluated in the Draft Environmental Impact Statement (EIS), including a fiscal impact assessment report completed in April, 2016 by Plasch Economics Pacific. Draft EIS Section 4.15 addresses demographic and economic factors, with the complete report in Appendix J.

The HDF project would create short-term benefits through jobs for local construction personnel and local material suppliers. Such jobs would include equipment operators, cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, supervisors, painters, etc. Based on State employment multipliers, indirect employment related to Dairy construction would be expected to average about 16 jobs on Kaua'i, and 8 on O'ahu. Construction employment would be expected to average about 12 jobs per year during the development period. Thus direct-plus-indirect employment association with construction would be expected to average approximately 36 jobs, of which 28 would be on Kaua'i.

The HDF project would contribute to diversification of Kaua'i's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Hawai'i Island), approximately10 percent of Hawai'i's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and indirect full-time equivalent jobs on Kaua'i, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on O'ahu.

HDF is expected to generate a net income of approximately $68,000 to the County when the 699 cow herd is established. When the dairy has matured to full

production for the 699 cow dairy, net income to the State is calculated at $160,000 annually. With the potential contemplated herd size of up to 2,000 mature dairy cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be produced. This would double local milk production currently supplied by operational dairies on the Island of Hawai'i.

Additional employment generated by a possible expansion to accommodate the contemplated 2,000 mature dairy cow herd is estimated at approximately 3 construction jobs plus 4 indirect jobs on Kaua'i, and 2 indirect jobs on O'ahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an additional 5 full-time farm jobs would be added, with approximately 15 additional indirect jobs on Kaua'i and another 8 indirect jobs on O'ahu.

The dairy is expected to generate a net additional contribution to the County of approximately $8,000 for improvements related to expansion for the contemplated herd size of up to 2,000 mature dairy cows ($76,000 total versus $68,000 for the committed herd size). The State will derive approximately $360,000 annually in revenues from the contemplated 2,000-mature dairy cow dairy.

Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

AIR QUALITY: As a part of the Environmental Impact Statement (EIS), existing air quality conditions and project impacts were evaluated, including dust and odor. Potential odors and emission levels for air pollutants relevant to dairy operations were modeled, as currently there are no cows on site. EIS sections 4.19 and 4.25 provide an evaluation of air quality and odors, including a windrose depicting wind speed and direction in the area (see DEIS Section 4.1, Climate). The full air quality technical report can be found in Draft EIS Appendix I.

Clean Air Act

Under the *Clean Air Act of 1970* (CAA), amended November 1990, the U.S. Environmental Protection Agency (EPA) regulates both large and small sources of air pollutants by establishing National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. The State of Hawai'i has established its own *State Ambient Air Quality Standards* (SAAQS) that are as strict or, in some cases more strict than the NAAQS. State standards prohibit any visible emissions of fugitive dust from construction activities at the property line.

Emissions relevant to livestock operation include particulate matter and fugitive dust. Greenhouse gases related to dairy cows include methane (CH_4) from enteric fermentation, and both methane and nitrous oxide (N_20) emissions from manure application. No State or Federal regulations for greenhouse gas emissions from farm operations or small businesses currently exist.

DUST

Dust will be generated as cows move along soft limestone walkways that connect the paddocks and lead to and from the milking parlor. Potential fugitive dust emission rates were estimated from published literature, where particulate matter (PM) is measurable from the "drylots" of confined dairy operations where animals walk over dirt and dried manure throughout the day.

Applying the emission rates from this available literature greatly overestimates potential emission resulting from HDF. Cows in the pastoral rotational-grazing system will be on pasture 22 hours each day and will spend two hours – in two separate milking cycles –moving to and from the barn for the 10- to 15-minute milking sessions.

Using atmospheric dispersion modeling system (AERMOD), the rates were scaled to the size of the non-pasture areas used by cows at HDF. Results were added to the background concentration of particulate matter (both PM_{10} and $PM_{2.5}$) measured on the island of Kaua'i, and the total concentration was compared to the State ambient air quality standards. Only the contemplated herd size of up to 2,000 mature dairy cows was modeled, as at the lower threshold of 699 cows, the potential fugitive dust impact would be negligible. The estimated concentration for PM_{10} is 2.01 $\mu g/m^3$, well below the State standard of 150 $\mu g/m^3$. The estimated concentration for $PM_{2.5}$ is 0.23 $\mu g/m^3$, well below the Federal standard of 35 $\mu g/m^3$ (see Draft EIS Section 4.19 and Table 4-19.2).

ODOR

Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF, so air dispersion models were used to determine potential odor levels. Local weather data was used in conjunction with the AERMOD modeling system, and published rates for manure odors emissions for dairy heifers and effluent ponds were adapted to reflect the HDF facilities.

Odor emission sources identified for modeling at HDF were manure in the pasture fields, irrigation water containing diluted nutrients from effluent, the effluent storage ponds, and the dairy buildings. Odor rates from published research were applied. Odor isopleths (a line used to map all points having the same numerical value) were created to display the model findings. Odor is described in "odor units" at the threshold of perception, which is defined by the point at which 50 percent of panelists, in laboratory conditions, cannot smell the odor but 50 percent of the panelists can detect the odor.

Modeling results were generated for worst case meteorological conditions (low wind velocity / mixing). Generally, tradewinds will disperse odors to less than detectable levels beyond the HDF site; in periods of no wind, odor may not be dispersed creating the "worst case" scenario. In these periods without normal tradewind flow, the odor plume would extend to the south of the HDF site. Sections 4.19.2 and 4.25.2 of the EIS include graphics of the potential odor isopleths.

Results for the committed herd size of 699 mature dairy cows show that odors may be detectable by 50 percent of the sensitive population once per 200 hours, or 44 hours per year, within an area that extends approximately 1,670-feet (within one-third of a mile) beyond the dairy farm boundary, and does not reach recreational or residential areas. Results for the contemplated expanded herd size of up to 2,000 mature dairy cows show odors would not extend beyond 2,780 feet outside the HDF boundary (just over half a mile), again not reaching recreational or residential areas, and again with detection limited to 50 percent of the sensitive population approximately 44 hours per year. The parameters used in the analysis were intentionally conservative, and the impacts shown assume an unlikely confluence of worst-case meteorological data, irrigation location, and grazing location. Actual offsite odor impacts are likely to be much lower and/or less frequent than shown; it is likely odor detection beyond the HDF boundaries will be less frequent.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

From: Beam, Craig @ CBRE Healthcare [mailto:Craig.Beam@cbre.com]
Sent: Friday, February 20, 2015 5:53 AM
To: EPO
Subject: Mahaulepu Valley Dairy Farm

Gentlemen:

I wanted to express my concern and the need to address not only the health concerns, but also the potential economic risk of a dairy farm in Mahaulepu.
We have been homeowners in Poipu since 1979 and have deep concerns about the impact of a Dairy Farm so close to a resort area. I grew up in an area of large cattle ranches (non-dairy) that had about the same density of use as proposed in this case. The ranchers always referred to the persistent malodorous aroma as "the smell of money"!

The prevailing wind comes from the east-north-east which will result in blowing smells towards Mahaulepu Beach, the Hyatt and our residential area. This might remind me of my childhood, but certainly not in a pleasant way! The amount of manure and urine that will be produced by the cattle will leave a lingering odor that cannot be mitigated.

The potential economic risk to the tourist economy of Poipu, not to mention the potential health risk of runoff impact on the nearby beaches far exceeds the potential benefit.
The collection area for manure during milking is designed for a "25 year rain event". If anything occurs in excess of this there would likely be direct runoff into the ocean. Just a few incidents of beach closures as the result of inadvertent runoff could have a devastating effect on the area.

Surely there are other agricultural areas on Kauai where an operation such as this could be located that would have far less potential environmental and economic impact.

Sincerely,

Craig Beam

Craig Beam
Manualoha #504
Poipu Kai
Koloa, HI

GROUP 70 INTERNATIONAL

May 26, 2016

Craig Beam
Craig.Beam@cbre.com

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Craig Beam:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

NATURAL HAZARDS: The potential impacts of natural hazards are evaluated in the Draft Environmental Impact Statement (EIS), including flooding, tsunami, earthquakes, and hurricanes. Draft EIS Section 4.6 addresses natural hazards.

The Māhā'ulepū property is not known to experience flooding conditions. The area is located within Federal Emergency Management Agency (FEMA) Zone X, areas determined to be outside the 0.2% annual chance floodplain. The proposed location for Hawai'i Dairy Farms (HDF) lies between the 60 and 150 feet elevation, outside the tsunami evacuation zone. The Kaua'i and Ni'ihau region of the Hawaiian Islands has experienced tremors from earthquakes originating further south in the island chain, but no known seismic activity has originated among these northern islands.

Although they occur infrequently, Kaua'i has received a greater amount of damage from hurricanes when compared to the other Hawaiian Islands. Land management

personnel in the Māhāʻulepū region during and following the hurricanes that affected Kauaʻi in 1982 and 1992 observed defoliation of vegetation, and no flooding events in the period following passage of the storms.

Preparedness is the best protection for natural disasters. Structural design of dairy facilities will meet International Building Code (IBC) 2006 standards with local amendments. Provisions in design will address wind loading (including hurricane gusts), rain and flood loading, and earthquake loading. A geotechnical evaluation of the area recommended Seismic Site Class D under IBC standards be utilized for foundation design where the barns and agricultural infrastructure will be constructed.

There has been no rainfall event that would exceed the capacity of the effluent ponds since rainfall has been recorded in Māhāʻulepū Valley. The effluent pond capacity has been designed above the regulatory requirement to contain the 25-year, 24-hour rainfall event. An emergency containment berm with additional capacity for another 30 days is included in the design. This design exceeds regulatory requirements, with containment in excess of the major rainfall events recorded on Kauaʻi over the past three decades.

An emergency preparedness plan for protection of animals has been prepared for HDF internal use that addresses hurricane, fire, and potential flooding hazard scenarios. HDF is not in a tsunami inundation area, so this scenario is not planned for in the disaster plan. The disaster plan relies upon knowledge of cow behavior, and is based on extensive guidance for livestock protection from NRCS, the Florida State Agricultural Response Team (SART), Pennsylvania State College of Agricultural Sciences, and Cornell University Cooperative Extension. The plan includes safety procedures during any disaster, follow up actions, and emergency contacts for assistance before, during or following the event. Further information is provided in the Draft EIS Section 4.6.2.

DEMOGRAPHIC AND ECONOMIC: The potential impacts of Hawai'i Dairy Farms (HDF) to the existing economy were evaluated in the Draft Environmental Impact Statement (EIS), including a fiscal impact assessment report completed in April, 2016 by Plasch Economics Pacific. Draft EIS Section 4.15 addresses demographic and economic factors, with the complete report in Appendix J.

The HDF project would create short-term benefits through jobs for local construction personnel and local material suppliers. Such jobs would include equipment operators, cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, supervisors, painters, etc. Based on State employment multipliers, indirect employment related to Dairy construction would be expected to average about 16 jobs on Kauaʻi, and 8 on Oʻahu. Construction employment would be expected to average about 12 jobs per year during the development period. Thus direct-plus-indirect employment association with construction would be expected to average approximately 36 jobs, of which 28 would be on Kauaʻi.

The HDF project would contribute to diversification of Kauaʻi's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Hawaiʻi Island), approximately10 percent of Hawaiʻi's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and indirect full-time equivalent jobs on Kauaʻi, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on Oʻahu.

HDF is expected to generate a net income of approximately $68,000 to the County when the 699 cow herd is established. When the dairy has matured to full production for the 699 cow dairy, net income to the State is calculated at $160,000 annually. With the potential contemplated herd size of up to 2,000 mature dairy cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be produced. This would double local milk production currently supplied by operational dairies on the Island of Hawaiʻi.

Additional employment generated by a possible expansion to accommodate the contemplated 2,000 mature dairy cow herd is estimated at approximately 3 construction jobs plus 4 indirect jobs on Kauaʻi, and 2 indirect jobs on Oʻahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an additional 5 full-time farm jobs would be added, with approximately 15 additional indirect jobs on Kauaʻi and another 8 indirect jobs on Oʻahu.

The dairy is expected to generate a net additional contribution to the County of approximately $8,000 for improvements related to expansion for the contemplated herd size of up to 2,000 mature dairy cows ($76,000 total versus $68,000 for the committed herd size). The State will derive approximately $360,000 annually in revenues from the contemplated 2,000-mature dairy cow dairy.

Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawaiʻi Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhāʻulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhāʻulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Poʻipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhāʻulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawaiʻi Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhāʻulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhāʻulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhāʻulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kauaʻi community.

Regional Water Demand: The adjacent, developed Kōloa-Poʻipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kauaʻi will increase county-wide by 17,300 residents by 2030. The South Kauaʻi population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kauaʻi region (the Kōloa - Poʻipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhāʻulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhāʻulepū watershed.

The HDF site is located on the bottom-land of the upper Māhāʻulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Haʻupu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhāʻulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kaua'i Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhā'ulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhā'ulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhā'ulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top

of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhā'ulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Po'ipū region were also calculated. Nitrogen input to the marine environment in the Po'ipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Po'ipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kaua'i community.

AIR QUALITY: As a part of the Environmental Impact Statement (EIS), existing air quality conditions and project impacts were evaluated, including dust and odor. Potential odors and emission levels for air pollutants relevant to dairy operations were modeled, as currently there are no cows on site. EIS sections 4.19 and 4.25 provide an evaluation of air quality and odors, including a windrose depicting wind speed and direction in the area (see DEIS Section 4.1, Climate). The full air quality technical report can be found in Draft EIS Appendix I.

Clean Air Act

Under the *Clean Air Act of 1970* (CAA), amended November 1990, the U.S. Environmental Protection Agency (EPA) regulates both large and small sources of air pollutants by establishing National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. The State of Hawai'i has established its own *State Ambient Air Quality Standards* (SAAQS) that are as strict or, in some cases more strict than the NAAQS. State standards prohibit any visible emissions of fugitive dust from construction activities at the property line.

Emissions relevant to livestock operation include particulate matter and fugitive dust. Greenhouse gases related to dairy cows include methane (CH_4) from enteric fermentation, and both methane and nitrous oxide (N_20) emissions from manure

application. No State or Federal regulations for greenhouse gas emissions from farm operations or small businesses currently exist.

DUST

Dust will be generated as cows move along soft limestone walkways that connect the paddocks and lead to and from the milking parlor. Potential fugitive dust emission rates were estimated from published literature, where particulate matter (PM) is measurable from the "drylots" of confined dairy operations where animals walk over dirt and dried manure throughout the day.

Applying the emission rates from this available literature greatly overestimates potential emission resulting from HDF. Cows in the pastoral rotational-grazing system will be on pasture 22 hours each day and will spend two hours – in two separate milking cycles –moving to and from the barn for the 10- to 15-minute milking sessions.

Using atmospheric dispersion modeling system (AERMOD), the rates were scaled to the size of the non-pasture areas used by cows at HDF. Results were added to the background concentration of particulate matter (both PM_{10} and $PM_{2.5}$) measured on the island of Kaua'i, and the total concentration was compared to the State ambient air quality standards. Only the contemplated herd size of up to 2,000 mature dairy cows was modeled, as at the lower threshold of 699 cows, the potential fugitive dust impact would be negligible. The estimated concentration for PM_{10} is 2.01 $\mu g/m^3$, well below the State standard of 150 $\mu g/m^3$. The estimated concentration for $PM_{2.5}$ is 0.23 $\mu g/m^3$, well below the Federal standard of 35 $\mu g/m^3$ (see Draft EIS Section 4.19 and Table 4-19.2).

ODOR

Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF, so air dispersion models were used to determine potential odor levels. Local weather data was used in conjunction with the AERMOD modeling system, and published rates for manure odors emissions for dairy heifers and effluent ponds were adapted to reflect the HDF facilities.

Odor emission sources identified for modeling at HDF were manure in the pasture fields, irrigation water containing diluted nutrients from effluent, the effluent storage ponds, and the dairy buildings. Odor rates from published research were applied. Odor isopleths (a line used to map all points having the same numerical value) were created to display the model findings. Odor is described in "odor units" at the threshold of perception, which is defined by the point at which 50 percent of panelists, in laboratory conditions, cannot smell the odor but 50 percent of the panelists can detect the odor.

Modeling results were generated for worst case meteorological conditions (low wind velocity / mixing). Generally, tradewinds will disperse odors to less than detectable levels beyond the HDF site; in periods of no wind, odor may not be

dispersed creating the "worst case" scenario. In these periods without normal tradewind flow, the odor plume would extend to the south of the HDF site. Sections 4.19.2 and 4.25.2 of the EIS include graphics of the potential odor isopleths.

Results for the committed herd size of 699 mature dairy cows show that odors may be detectable by 50 percent of the sensitive population once per 200 hours, or 44 hours per year, within an area that extends approximately 1,670-feet (within one-third of a mile) beyond the dairy farm boundary, and does not reach recreational or residential areas. Results for the contemplated expanded herd size of up to 2,000 mature dairy cows show odors would not extend beyond 2,780 feet outside the HDF boundary (just over half a mile), again not reaching recreational or residential areas, and again with detection limited to 50 percent of the sensitive population approximately 44 hours per year. The parameters used in the analysis were intentionally conservative, and the impacts shown assume an unlikely confluence of worst-case meteorological data, irrigation location, and grazing location. Actual offsite odor impacts are likely to be much lower and/or less frequent than shown; it is likely odor detection beyond the HDF boundaries will be less frequent.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

February 20, 2015

State of Hawaii – Department of Health
Laura McIntyre, Environmental Planning Office
919 Ala Moana Blvd., Room 312
Honolulu, HI 96814

Re: Hawaii Dairy Farms, Kauai

Aloha Ms. McIntyre:

It is my understanding that I should address any comments I have to you in regards to the EISN filed in connection with the proposed 2,000 head dairy for the Maha'ulepu Valley along the south shore of Kauai. I am a resident of the Poipu area and homeowner residing along Poipu Road near the Grand Hyatt Kauai Resort, within 1.5 miles of the property proposed for this use. If the dairy were to be developed as planned, the potential for exceedingly negative impacts to the Koloa/Poipu area would be eminent. This plan will place over 4 head per acre upon mostly clay soil types which cannot withstand such an intensive land use. These soil types cannot and will not hold the amount of nitrates and phosphates from this size of herd and the runoff will result in considerable pollution to not only the oceans fed by streams in the area such as the Waiopili, but also to the potable drinking water provided by Koloa wells within 750 feet west of the proposed dairy site. My research and knowledge of traditional agriculture and Animal Operations (AO) as a commercial and agricultural appraiser in Hawaii and in the Midwestern states of Iowa and Illinois, leads me to the conclusion that the dairy plan proposed by Hawaii Dairy Farms requires acreage in the thousands, not 578 acres as proposed.

The Poipu area is home to world class beaches and resorts that would be heavily impacted by ground water and ocean pollution emanating from surface runoff to the ocean and seepage into the potable water supply. The Koloa/Poipu area alone (census tract 150070406.03) accounts for 47.5% of all annual hotel and lodging revenue on Kauai amounting to over $110million in annual revenues. This area also contributes more than 23% of the County's total real property tax revenue or about $26,000,000 annually. Considering that the US Census classifies 86% of residential properties in the Koloa/Poipu area as "seasonal", and nearly 69% of all real property tax revenues in the area come from the vacation rental and hotel & resort tax classes, the local economy is sure to be especially impacted by this incompatible land use. In addition to ground water pollution and ocean pollution, odors, flies and noise emanating from the dairy would detract from what was once the allure of Poipu as a world class visitor destination, or as a desirable place to live. Occupancy rates at hotels and the 86% of housing units classified as 'seasonal' would plummet. The EIS must not only study the impacts to the environment, but must also study the potential impacts to the Poipu visitor economy which will be significantly impacted by the environmental consequences of such an intensive land use in the Maha'ulepu Valley.

Mahalo for your consideration to my concerns,

Curtis J. Bedwell, MAI
PO Box 1330
Koloa, HI 96756
Ph: (808) 755-5883
curtisbedwell@gmail.com

cc: Hawaii Dairy Farms, LLC
P.O. Box 1690
Koloa, HI 96756-1690

cc: Group 70 International, Inc.
925 Bethel St. 5th. Floor
Honolulu, HI 96813

May 26, 2016

Curtis J. Bedwell
P. O. Box 1330
Koloa, HI 96756
curtisbedwell@gmail.com

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Curtis J. Bedwell:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

DAIRY OPERATIONS: Hawai'i Dairy Farms (HDF) will establish and operate a sustainable, pastoral rotational-grazing dairy farm in Māhā'ulepū Valley on the island of Kaua'i to produce fresh, locally available nutritious milk for Hawai'i families. The rotational-grazing method utilizes 100 percent of the cows' manure as natural fertilizer to grow pasture grass as a primary source of nutrition for dairy cows. This cost-effective method will reduce reliance on imported fertilizer and feed. Pasture grass will comprise at least 70 percent of the animals' diet. As a part of the Draft Environmental Impact Statement (EIS), the proposed facilities and operations for the dairy farm are described in Chapter 3.

The Environmental Impact Statement (EIS) Preparation Notice (EISPN), published January 23, 2015, described the proposed pasture-based rotational grazing system as a "zero-discharge, grass-fed dairy". The term "zero-discharge" under the U.S. Environmental Protection Agency related to concentrated feeding operations (CAFO) is a system designed to not discharge pollutants into waters of the United States. As noted previously, the HDF system is designed to utilize 100 percent of the cows' manure on-site. However, nutrients would be introduced to the HDF site with any use; the Draft EIS identifies the amount of nutrients anticipated from the proposed dairy operations that could pass through to ground and surface waters. Therefore, HDF elected to discontinue use of the term "zero discharge" as it was construed as no nutrients into the system.

The term "grass-fed" was used in the HDF EISPN. This term was used to identify HDF's intent to utilize a locally-produced feedstock – grass – for more than 70 percent of the dairy herds' diet. In January 2016, the U.S. Department of Agricultural (USDA) Marketing Survey created a narrow legal definition of "grass-fed". The USDA standard defines what animals can and cannot be fed. The Food Alliance, a project of several northwest colleges, believes that when consumers choose grass-fed products there is an expectation that these will come from animals raised on pasture on a forage-based diet. Due to the evolving definition of "grass-fed", the term in not used in this EIS.

The dairy facilities will occupy an area of approximately 10 acres on the western boundary of the site. The developed area "footprint" will be less than 2 percent of the total farm area. Four buildings will be constructed to serve different functions, supported by utilities and infrastructure. Additional building information can be found in Draft EIS Section 3.3.1.

Agricultural infrastructure and utilities required for the dairy operations will include storage tanks and silos, effluent storage ponds, livestock water systems, and drainage improvements. The irrigation system and distribution of livestock water are discussed in Draft EIS Section 3.5, Pasture Management.

The pastoral rotational-grazing dairy provides a local feedstock – grass – as the herd's primary food source. Reducing imported feed stabilizes costs and provides a food source closer to the natural diet of cows. Results of grass trials initially conducted at five sites across four Hawaiian Islands were instrumental in identifying appropriate varieties of grass, and suitable sites to support sufficient "dry matter" grass yields essential to a cow's diet. Additional project-specific trials at the Māhā'ulepū site on Kauai have been conducted for more than 18 months. The results have identified sufficient yield and nutrition to supply 70 percent of the cows' diet; improvements in grass productivity are anticipated to provide up to 85 percent of cows' diet.

The pasture-based model allows cows to move about freely, and to lie down and rest, which is part of the digestion cycle. The animals are managed in social groups known as "mobs", mimicking the natural social order of bovines. Cows spend 22 hours of each 24-hour period foraging on pasture or resting, outdoors in natural light and fresh air. The gently sloped paddocks, walkways and races minimize the

energy expended by the mature dairy cows as they graze or are transferred to and from the various paddocks and the mature dairy facility; surfaces of the walkways and cow races are designed to provide a comfortable path under hoof. The management practices and pasture model applied by HDF maximizes grass as the cows' primary nutrition source and minimizes stress to the animals. Cows tend to be healthier and live longer, productive lives with access to fresh air, high quality feed, and exercise while they forage.

The 470 acres of pasture will be divided into paddocks averaging 3 to 5 acres in size. Smaller paddocks located near the dairy facility will be used as temporary pasture for cows or calves being moved on or off the farm. To protect the water quality of surface water and downstream areas, paddock fences are set back 35 feet from the edge of drainage ways throughout the site. Existing vegetation within the setbacks will be managed or restored to reduce erosion, improve stability of ditch banks, increase net carbon storage, and improve and maintain water quality.

The majority of the pastures will be irrigated with non-potable water and/or diluted effluent through either the pivot irrigation systems or through gun irrigators. Irrigation water supply is provided to the farm from Waita Reservoir, and will be filtered and pumped to the various irrigation components on the farm. The irrigation system is controlled using computer software and GPS receivers to allow very precise application of irrigation and/or diluted effluent on the pasture. The pivots can rotate and apply irrigation water and/or diluted effluent at different rates depending on the actual irrigation needs of the farm.

NRCS provides technical guidance on applying agricultural waste depending on the desired use of the waste. Reflected in the title of the livestock waste guidance for Hawai'i is the parenthetical inclusion of the word "nutrients." Where waste is utilized as a resource, it is being used for the constituent components that provide benefit.

The NRCS Conservation Practice Standard 590, Nutrient Management, applies to commercial fertilizers, organic by-products, waste water, organic matter, and irrigation water. Nutrient management is the practice of managing the amount, rate, source, method of application, and timing of plant nutrients and soil amendments. The timing and application of nutrients will correspond with plant uptake, soil properties and weather conditions. For more information on nutrient balance management see Draft EIS Section 3.5.3, and Draft EIS Appendix D.

The effluent storage ponds are sized to accommodate 30 days of storage for up to 2,000 mature dairy cows, and over 85 days of storage for 699 mature dairy cows. It will be highly unlikely that the storage pond will be full at any time for the contemplated 2,000-cow dairy, and nearly impossible for the committed 699-cow dairy. Throughout the less than 30-day storage period, effluent is planned for application every four days, and the slurry application is expected at least once every 45 days, to ensure that the ponds are kept at manageable levels.

Cows lactate milk following the birth of calves. Newborn calves will be housed on the Māhā'ulepū site and provided essential colostrum and nutrients for a healthy

start. During the calves' initial 90 days, they will be transitioned to pasture at HDF before transfer to ranches on Kaua'i to be raised off-site. The committed herd size of 699 mature dairy cows at the Māhā'ulepū site applies to mature mature dairy cows. Animals in various stages of lactation and rest will be transferred between HDF and other partner ranches as needed for animal health and dairy productivity. This will benefit both the dairy and infuse the beef market in Hawai'i with a new, local source of pasture-raised calves. Male calves will become part of the beef cattle herd; heifers (young female calves that haven't given birth) will be raised until ready to return to the HDF herd as a birthing/mature dairy cow. For more information on off-site herd management, refer to Section 3.7 of the Draft EIS.

Health of the herd is of primary importance as the success of a dairy relies on cows effectively producing quality milk. All cows will be treated with a high standard of care. Dairy managers and caretakers will be trained and competent in handling animals to minimize stress and ensure the herds' welfare. A licensed veterinarian may prescribe use of antibiotics approved by the Food & Drug Administration (FDA) for treatment of illnesses. Adherence to guidelines that prohibit milk from cows undergoing antibiotic treatment will ensure no adulteration of milk. Routine laboratory tests of milk for traces of antibiotic residue will be conducted. HDF will not inject cows with bovine growth hormone, referred to as rBST or rBGH.

SOILS: Soil is an ecosystem that can be managed to provide nutrients for plant growth, to absorb and hold rainwater for use during dryer periods, to filter and buffer potential pollutants from leaving fields, to serve as a firm foundation for agricultural activities, and to provide habitat for soil microbes to flourish and diversify to keep the ecosystem healthy. Two rounds of independent soil sampling were undertaken at HDF to understand and characterize available soil nutrients and conditions. Section 4.3 of the Environmental Impact Statement (EIS) characterizes soil conditions, and anticipated impacts from effluent and supplemental nutrient application. Recommendations from Dr. Russell Yost and Nicholas Krueger of the University of Hawai'i at Mānoa are summarized. Their baseline nutrient report is included as Appendix C of the Draft EIS.

Soil conservation is a core principal behind establishment of the NRCS, which was formed out of the Soil Conservation Service to acknowledge its expanded role in watershed-scale approach using science-based tools and standards in agronomy, engineering economics, wildlife biology and other disciplines to aid landowners in implementation of conservation practices. NRCS conservation practices are listed in Chapter 3, Section 3.2; these practices codes identify design and construction standards related to drainage, materials, operations and applicable engineering standards. HDF will follow the developed Conservation Plan, which was approved by the West Kaua'i Soil & Water Conservation District in December, 2013.

The United States Department of Agriculture (USDA) Natural Resources Conservation Services (NRCS) has mapped and classified soils for more than 95 percent of the United States. Comments received during the initial scoping for this EIS included a "Custom Soils Resource Report for Island of Kaua'i, Hawai'i." The report was generated from the USDA NRCS website, which allows any internet user to define an area of interest, customize data results, and generate a Custom Soil

Resource Report. The user can select or deselect parameters based upon which data the user would like to display. These user-generated reports are not evaluated by NRCS.

The NRCS soils classifications and descriptions provide a good information base, however, in-field soils testing is needed to identify existing soil nutrient levels and conditions. The most abundant soil types at the HDF site are Kalihi Clay at 32 percent, Ka'ena Clay Brown Variant at 29 percent, and Lualualei Clay at roughly 14 percent of the dairy site. Laboratory analysis of soil samples collected in 2014 identified levels of pH, phosphorus, nitrogen, potassium, calcium, magnesium, organic matter, salinity, micronutrients and other constituents. The results illustrate that the soils are depleted of nutrients, which is typical for lands formerly used for sugarcane. The soil nutrient status and fertility demands of the primary crop, Kikuyu grass, were used to identify the quantities of nutrients required for productive grass growth. The soils data provide a baseline to guide adaptive nutrient management throughout establishment and maturity of the dairy.

A second round of field sampling was conducted in 2015, and focused on evaluation of soils characterized as "poorly drained", and established a quantitative baseline of soil salinity and sodicity to provide for future monitoring of soil health with application of manure effluent. Laboratory analysis determined electrical conductivity and exchangeable sodium percentage, in addition to nutrient levels of nitrogen phosphorus calcium, magnesium, and potassium.

Poorly drained is not an indication of low or poor infiltration. Infiltration refers to the ability of water to enter the soil surface, whereas "drainage" refers to the movement of water within or from the soil profile. Poorly drained soils typically have low hydraulic conductivity, or a slow rate of groundwater movement through the soil. This slow movement can create anaerobic conditions, which typically result in higher rates of denitrification. This is the conversion of potentially nitrates and nitrites to gaseous forms, which reduces the potential for impacts on waterbodies. In this way, "poorly drained" soils may represent less risk of nitrate and nitrite leaching to associated waterbodies than "well drained" soils (Yost, 2016).

As a result of reduced movement of water through the soil profile, the mobility of nutrients such as potassium and phosphorus is also reduced. Soil types at the HDF site are known to adsorb and retain large amounts of phosphorus. Under the NRCS phosphorus leaching index for Hawai'i soils, HDF soils show low risk for leaching. With low risk, phosphorus can be applied at rates greater than crop requirements if manure or other organic materials are used to supply nutrients.

The dairy's focus on robust and healthy grass growth will build organic matter in soils through use of manure as a natural fertilizer. Soil can incorporate carbon from the atmosphere, which benefits soil health. According to recent studies in the Soil Science Society of America Journal, the conversion of formerly tilled cropland to grazed pasture can drive substantial accumulation of organic carbons in soil, with a potential to offset up to one-third of the annual increase in atmospheric carbon dioxide. The potential soil organic matter and carbon dioxide sequestration benefits are likely greatest in highly degraded soils in warm subtropical climates, partly due

to long pasture-growing seasons. Long-term soil impacts are anticipated to result in improvement to the physical, chemical, and biological condition of the soil.

DEMOGRAPHIC AND ECONOMIC: The potential impacts of Hawai'i Dairy Farms (HDF) to the existing economy were evaluated in the Draft Environmental Impact Statement (EIS), including a fiscal impact assessment report completed in April, 2016 by Plasch Economics Pacific. Draft EIS Section 4.15 addresses demographic and economic factors, with the complete report in Appendix J.

The HDF project would create short-term benefits through jobs for local construction personnel and local material suppliers. Such jobs would include equipment operators, cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, supervisors, painters, etc. Based on State employment multipliers, indirect employment related to Dairy construction would be expected to average about 16 jobs on Kaua'i, and 8 on O'ahu. Construction employment would be expected to average about 12 jobs per year during the development period. Thus direct-plus-indirect employment association with construction would be expected to average approximately 36 jobs, of which 28 would be on Kaua'i.

The HDF project would contribute to diversification of Kaua'i's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Hawai'i Island), approximately10 percent of Hawai'i's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and indirect full-time equivalent jobs on Kaua'i, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on O'ahu.

HDF is expected to generate a net income of approximately $68,000 to the County when the 699 cow herd is established. When the dairy has matured to full production for the 699 cow dairy, net income to the State is calculated at $160,000 annually. With the potential contemplated herd size of up to 2,000 mature dairy cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be produced. This would double local milk production currently supplied by operational dairies on the Island of Hawai'i.

Additional employment generated by a possible expansion to accommodate the contemplated 2,000 mature dairy cow herd is estimated at approximately 3 construction jobs plus 4 indirect jobs on Kaua'i, and 2 indirect jobs on O'ahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an additional 5 full-time farm jobs would be added, with approximately 15 additional indirect jobs on Kaua'i and another 8 indirect jobs on O'ahu.

The dairy is expected to generate a net additional contribution to the County of approximately $8,000 for improvements related to expansion for the contemplated herd size of up to 2,000 mature dairy cows ($76,000 total versus $68,000 for the

committed herd size). The State will derive approximately $360,000 annually in revenues from the contemplated 2,000-mature dairy cow dairy.

Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhā'ulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhā'ulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Po'ipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhā'ulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic

material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawai'i Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhā'ulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhā'ulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhā'ulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kaua'i community.

Regional Water Demand: The adjacent, developed Kōloa-Po'ipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kaua'i will increase county-wide by 17,300 residents by 2030. The South Kaua'i population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kaua'i region (the Kōloa - Po'ipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and

visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhāʻulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhāʻulepū watershed.

The HDF site is located on the bottom-land of the upper Māhāʻulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Haʻupu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhāʻulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kauaʻi Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhāʻulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhāʻulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could

be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhāʻulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Poʻipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kauaʻi community.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawaiʻi Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

February 23, 2015

RECEIVED

FEB 25 2015

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From: Betty J. Bell
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I have been a south shore realtor for 35 years and before that a pharmacist for 14 years on Kauai. I have two residences, my home and a rental providing my retirement income, both in Poipu and the immediate vicinity of the proposed dairy. I cannot understand how anyone would consider spoiling the pristine area of Mahaulepu, with a project that is hazardous to the island and our health, and would like to be kept informed of all stages of the Dairy EIS.

To begin, I would appreciate an evaluation of the company chosen for the EIS, Group 70 International, and whether they have any experience in environmental studies and whether they can present unbiased reports, given their investment in the Hawaii Dairy Farms (HDF) building design. Experts can the bought and then the EIS may not protect the public interest. How can we be assured that the EIS will lead to an impartial evaluation?

Dairy Farm pollution is of major concern in other states and has not been resolved in a timely fashion by the EPA. Since the Dairy is modeled on New Zealand examples, the EIS should also model the clean-up process, forecast as millions or billions for similar coastline areas, and provide bonds for those costs, which will otherwise be the burden of state, county, and taxpayers.

Whether the agri-business or any other, one needs to make a profit without deleterious effects on others. The south shore includes Kauai's major hotel and condominium resorts, expensive vacation homes and residences, popular beaches and other tourist activities. The tax base of this area depends upon its popularity, beautiful outdoors and ideal weather conditions, all of which would be severely impacted by a dairy farm close by, likely to be much more significant than any revenue from the proposed Dairy. Trends show that an intrusion like this one into resort areas, is likely to decrease property values by 25% to 40%, and make close by homes unmarketable. Our entire Kauai economy would be affected when tourists "get wind of" the smell and spoiled beaches on the south shore. The EIS needs to specify how these effects would be avoided, because pollution of the ocean and nearby beaches seems inevitable with the current HDF plan and insufficient waste management plan.

First and foremost, another site should be located for the Dairy where the entire operation can be accommodated, including processing of the milk. The Mahaulepu area should only be considered for other agricultural use, taro or other crops which would not disturb the natural flora and fauna already established. Cattle or any livestock would destroy much of the natural terrain and the species it currently supports. The special zones of Mahaulepu, and marine environment need protection, especially from the existing streams and waterways flowing into the ocean. Monk seals, for example, come to the Mahaulepu shoreline yearly, have their pups there, and return for generations. They are particularly prone to bacteriological infection. How will the runoff affect their limited numbers? The zoonotic diseases carried by cattle would effect humans and other mammals, from the waste runoff, insects and wind carrying bacteria for miles to surrounding areas. The EIS should include a plan to control all contamination of the surrounding environment, including all vectors of disease. The most obvious need is to control the biting black flies without the use of more chemical pesticides.

The EIS needs to evaluate, prevent and plan control of algae blooms created by even a slight change in ocean temperature or acidity, likely to be the effect of this many cows in one area. The cumulative waste for one month is estimated at 3 million lbs of manure and 210,000 gallons of urine for 699 cows (HDF Plan, 143 lbs/cow/day x 699 cows x 30 days = 2,998,710 lbs manure each month) and 8.5 million lbs of manure and 600,000 gallons of urine for 2000 cows, with all waste remaining on the site. Does the plan allow for that much ongoing monthly accumulation of untreated waste in one location? In comparison, it is about 5 times more defecation than that of the entire Kauai human population, which we would certainly not allow to be deposited untreated on the surface of any one area.

Air, land, and water contamination by cattle waste, nitrates, phosphates, ammonia and methane is unacceptable. The amount of methane produced can be cumulative in the atmosphere and reduce the ozone layer, to produce a hotter, dryer climate. The 286,000 pounds of manure a day will not be absorbed by the clay soil efficiently. With winter rains and wind, the absorption will be less and runoff to the ocean more likely. The EIS must speak to the amelioration of the air, water and soil with scientifically determined testing by qualified disinterested specialists and the Department of Health.

In addition to ground water pollution and surrounding well pollution, the EIS needs to speak to the availability of water sources for the cattle. It is my understanding that the 1957 (Huleia) diversion of headwaters to the Mahaulepu watershed was to be removed so that water is restored to the original flow, which would probably leave an insufficient supply for cattle. The right and title to water supply is in question, along with Hawaiian rights and state property. In any case, the EIS process should determine what encumberances the Dairy use of water places on Kauai's other uses of it's water supply.

Thank you in advance for a response to my comments, Betty J. Bell

Betty J Bell

May 26, 2016

Betty Bell
bellpss@gmail.com

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Betty Bell:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

GROUP 70 OBJECTIVITY: Group 70 International, Inc. (Group 70) is responsible for the preparation and processing of the Hawai'i Dairy Farms Environmental Impact Statement (EIS). The EIS was prepared in accordance with the requirements of Chapter 343 Hawai'i Revised Statutes and the "Environmental Impact Statement Rules" (Chapter 200 of Title 11, Hawai'i Administrative Rules). The environmental planning team at Group 70 has prepared several hundred Environmental Assessment and EIS documents over the past 40 years, and every document has been accepted by the responsible County, State and Federal agency. On numerous past EIS projects, the Hawai'i Chapter of the American Planning Association has recognized Group 70's professional work with Chapter awards for excellence in environmental planning. Part of the EIS scoping process involves Group 70's experienced team of technical sub consultants that are well-known and qualified in their respective fields of study. For this project, Group 70 is preparing the Hawai'i

Dairy Farms EIS with the level of analysis required to properly evaluate and disclose the existing environmental conditions, probable impacts with mitigation, and potential cumulative and secondary effects.

DAIRY OPERATIONS: Hawai'i Dairy Farms (HDF) will establish and operate a sustainable, pastoral rotational-grazing dairy farm in Māhā'ulepū Valley on the island of Kaua'i to produce fresh, locally available nutritious milk for Hawai'i families. The rotational-grazing method utilizes 100 percent of the cows' manure as natural fertilizer to grow pasture grass as a primary source of nutrition for dairy cows. This cost-effective method will reduce reliance on imported fertilizer and feed. Pasture grass will comprise at least 70 percent of the animals' diet. As a part of the Draft Environmental Impact Statement (EIS), the proposed facilities and operations for the dairy farm are described in Chapter 3.

The Environmental Impact Statement (EIS) Preparation Notice (EISPN), published January 23, 2015, described the proposed pasture-based rotational grazing system as a "zero-discharge, grass-fed dairy". The term "zero-discharge" under the U.S. Environmental Protection Agency related to concentrated feeding operations (CAFO) is a system designed to not discharge pollutants into waters of the United States. As noted previously, the HDF system is designed to utilize 100 percent of the cows' manure on-site. However, nutrients would be introduced to the HDF site with any use; the Draft EIS identifies the amount of nutrients anticipated from the proposed dairy operations that could pass through to ground and surface waters. Therefore, HDF elected to discontinue use of the term "zero discharge" as it was construed as no nutrients into the system.

The term "grass-fed" was used in the HDF EISPN. This term was used to identify HDF's intent to utilize a locally-produced feedstock – grass – for more than 70 percent of the dairy herds' diet. In January 2016, the U.S. Department of Agricultural (USDA) Marketing Survey created a narrow legal definition of "grass-fed". The USDA standard defines what animals can and cannot be fed. The Food Alliance, a project of several northwest colleges, believes that when consumers choose grass-fed products there is an expectation that these will come from animals raised on pasture on a forage-based diet. Due to the evolving definition of "grass-fed", the term in not used in this EIS.

The dairy facilities will occupy an area of approximately 10 acres on the western boundary of the site. The developed area "footprint" will be less than 2 percent of the total farm area. Four buildings will be constructed to serve different functions, supported by utilities and infrastructure. Additional building information can be found in Draft EIS Section 3.3.1.

Agricultural infrastructure and utilities required for the dairy operations will include storage tanks and silos, effluent storage ponds, livestock water systems, and drainage improvements. The irrigation system and distribution of livestock water are discussed in Draft EIS Section 3.5, Pasture Management.

The pastoral rotational-grazing dairy provides a local feedstock – grass – as the herd's primary food source. Reducing imported feed stabilizes costs and provides a

food source closer to the natural diet of cows. Results of grass trials initially conducted at five sites across four Hawaiian Islands were instrumental in identifying appropriate varieties of grass, and suitable sites to support sufficient "dry matter" grass yields essential to a cow's diet. Additional project-specific trials at the Māhāʻulepū site on Kauai have been conducted for more than 18 months. The results have identified sufficient yield and nutrition to supply 70 percent of the cows' diet; improvements in grass productivity are anticipated to provide up to 85 percent of cows' diet.

The pasture-based model allows cows to move about freely, and to lie down and rest, which is part of the digestion cycle. The animals are managed in social groups known as "mobs", mimicking the natural social order of bovines. Cows spend 22 hours of each 24-hour period foraging on pasture or resting, outdoors in natural light and fresh air. The gently sloped paddocks, walkways and races minimize the energy expended by the mature dairy cows as they graze or are transferred to and from the various paddocks and the mature dairy facility; surfaces of the walkways and cow races are designed to provide a comfortable path under hoof. The management practices and pasture model applied by HDF maximizes grass as the cows' primary nutrition source and minimizes stress to the animals. Cows tend to be healthier and live longer, productive lives with access to fresh air, high quality feed, and exercise while they forage.

The 470 acres of pasture will be divided into paddocks averaging 3 to 5 acres in size. Smaller paddocks located near the dairy facility will be used as temporary pasture for cows or calves being moved on or off the farm. To protect the water quality of surface water and downstream areas, paddock fences are set back 35 feet from the edge of drainage ways throughout the site. Existing vegetation within the setbacks will be managed or restored to reduce erosion, improve stability of ditch banks, increase net carbon storage, and improve and maintain water quality.

The majority of the pastures will be irrigated with non-potable water and/or diluted effluent through either the pivot irrigation systems or through gun irrigators. Irrigation water supply is provided to the farm from Waita Reservoir, and will be filtered and pumped to the various irrigation components on the farm. The irrigation system is controlled using computer software and GPS receivers to allow very precise application of irrigation and/or diluted effluent on the pasture. The pivots can rotate and apply irrigation water and/or diluted effluent at different rates depending on the actual irrigation needs of the farm.

NRCS provides technical guidance on applying agricultural waste depending on the desired use of the waste. Reflected in the title of the livestock waste guidance for Hawaiʻi is the parenthetical inclusion of the word "nutrients." Where waste is utilized as a resource, it is being used for the constituent components that provide benefit.

The NRCS Conservation Practice Standard 590, Nutrient Management, applies to commercial fertilizers, organic by-products, waste water, organic matter, and irrigation water. Nutrient management is the practice of managing the amount, rate, source, method of application, and timing of plant nutrients and soil amendments.

The timing and application of nutrients will correspond with plant uptake, soil properties and weather conditions. For more information on nutrient balance management see Draft EIS Section 3.5.3, and Draft EIS Appendix D.

The effluent storage ponds are sized to accommodate 30 days of storage for up to 2,000 mature dairy cows, and over 85 days of storage for 699 mature dairy cows. It will be highly unlikely that the storage pond will be full at any time for the contemplated 2,000-cow dairy, and nearly impossible for the committed 699-cow dairy. Throughout the less than 30-day storage period, effluent is planned for application every four days, and the slurry application is expected at least once every 45 days, to ensure that the ponds are kept at manageable levels.

Cows lactate milk following the birth of calves. Newborn calves will be housed on the Māhāʻulepū site and provided essential colostrum and nutrients for a healthy start. During the calves' initial 90 days, they will be transitioned to pasture at HDF before transfer to ranches on Kauaʻi to be raised off-site. The committed herd size of 699 mature dairy cows at the Māhāʻulepū site applies to mature mature dairy cows. Animals in various stages of lactation and rest will be transferred between HDF and other partner ranches as needed for animal health and dairy productivity. This will benefit both the dairy and infuse the beef market in Hawaiʻi with a new, local source of pasture-raised calves. Male calves will become part of the beef cattle herd; heifers (young female calves that haven't given birth) will be raised until ready to return to the HDF herd as a birthing/mature dairy cow. For more information on off-site herd management, refer to Section 3.7 of the Draft EIS.

Health of the herd is of primary importance as the success of a dairy relies on cows effectively producing quality milk. All cows will be treated with a high standard of care. Dairy managers and caretakers will be trained and competent in handling animals to minimize stress and ensure the herds' welfare. A licensed veterinarian may prescribe use of antibiotics approved by the Food & Drug Administration (FDA) for treatment of illnesses. Adherence to guidelines that prohibit milk from cows undergoing antibiotic treatment will ensure no adulteration of milk. Routine laboratory tests of milk for traces of antibiotic residue will be conducted. HDF will not inject cows with bovine growth hormone, referred to as rBST or rBGH.

FLORA AND FAUNA: Botanical, avian, and mammalian surveys of the property were conducted for the Draft Environmental Impact Statement (EIS) to assess existing species on site, including identifying any species listed as endangered, threatened, or proposed under any state or federal endangered species programs in or near the property. EIS Sections 4.9 and 4.10 address the evaluation of flora and fauna resources, with technical studies in Appendix A and B.

A botanical survey of the dairy property was conducted in August 2014 by AECOS Consulting to assess existing plant species. The survey also investigated for the presence of plants currently listed as endangered, threatened or proposed for listing under Federal or the State of Hawaiʻi's endangered species programs, located onsite or within the immediate vicinity of the dairy site. The nature of the land and its present and historical uses for intensive agriculture very much limit the natural botanical resources anticipated to occur on this land. Complete species lists are

included in the EIS, and no protected botanical species occur on the project property. The project will include vegetated buffer strips along the drainage ways as part of the Conservation Plan to reduce erosion and stabilize slopes. Where native plants occur or could survive if planted, native plants will be used in the stabilization. No long-term impacts to native plant habitats or endangered or threatened plants species will occur as a result of the dairy.

Avian and mammalian surveys were conducted in August 2014 by Rana Biological Consulting, Inc. This survey was conducted to assess the potential presence of avian or mammalian species currently listed as endangered, threatened or proposed for listing under either Federal or the State endangered species lists. The survey covered the dairy site area and immediate vicinity. Common birds and terrestrial mammals were encountered on the property. There is no critical habitat for endangered species in the upper Māhāʻulepū Valley.

Four species of endangered waterbirds were recorded on the site and at the nearby taro farm located within the HDF site. Though the area does not provide critical habitat, seabirds that nest in upland areas of Kauai may overfly the site. The endangered Hawaiian goose, nēnē was also seen on the site. State Division of Forestry and Wildlife biologists have noted nēnē are regularly seen on the subject property. It is probable that some nest on or adjacent to the site as this species nests in the general Kōloa area, and the habitat present on parts of the site is suitable for nēnē nesting.

The principal potential impacts posed to the five endangered species include those potentially associated with construction activities, and those associated with dairy farm operations following build-out. Measures will be adopted to avoid potential seabird and nēnē goose collisions with fences and structures. Potential measures include lowering construction cranes at night, using conservation fencing to project-specified areas, marking tall structures and fencing with white visibility polytape, limiting nighttime lighting, and shading any outside lights used at night. Ongoing mitigation strategies will be implemented for day-to-day preventative measures, including an Avian Species Protection Plan. Mitigation measures are further described in DEIS Section 4.10.2.

It is also likely that Hawaiian hoary bats overfly the project area on a seasonal basis. While caution will be taken during any potential disturbance or vegetation removal, there are almost no suitable roost trees within the dairy site, thus it is expected that the dairy farm will not affect this listed mammalian species.

DEMOGRAPHIC AND ECONOMIC: The potential impacts of Hawai'i Dairy Farms (HDF) to the existing economy were evaluated in the Draft Environmental Impact Statement (EIS), including a fiscal impact assessment report completed in April, 2016 by Plasch Economics Pacific. Draft EIS Section 4.15 addresses demographic and economic factors, with the complete report in Appendix J.

The HDF project would create short-term benefits through jobs for local construction personnel and local material suppliers. Such jobs would include equipment operators, cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, supervisors, painters, etc. Based on State employment multipliers, indirect employment related to Dairy construction would be expected to average about 16 jobs on Kaua'i, and 8 on O'ahu. Construction employment would be expected to average about 12 jobs per year during the development period. Thus direct-plus-indirect employment association with construction would be expected to average approximately 36 jobs, of which 28 would be on Kaua'i.

The HDF project would contribute to diversification of Kaua'i's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Hawai'i Island), approximately10 percent of Hawai'i's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and indirect full-time equivalent jobs on Kaua'i, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on O'ahu.

HDF is expected to generate a net income of approximately $68,000 to the County when the 699 cow herd is established. When the dairy has matured to full production for the 699 cow dairy, net income to the State is calculated at $160,000 annually. With the potential contemplated herd size of up to 2,000 mature dairy cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be produced. This would double local milk production currently supplied by operational dairies on the Island of Hawai'i.

Additional employment generated by a possible expansion to accommodate the contemplated 2,000 mature dairy cow herd is estimated at approximately 3 construction jobs plus 4 indirect jobs on Kaua'i, and 2 indirect jobs on O'ahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an additional 5 full-time farm jobs would be added, with approximately 15 additional indirect jobs on Kaua'i and another 8 indirect jobs on O'ahu.

The dairy is expected to generate a net additional contribution to the County of approximately $8,000 for improvements related to expansion for the contemplated herd size of up to 2,000 mature dairy cows ($76,000 total versus $68,000 for the committed herd size). The State will derive approximately $360,000 annually in revenues from the contemplated 2,000-mature dairy cow dairy.

Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhā'ulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhā'ulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Po'ipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhā'ulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawai'i Department of Health Milk

Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhā'ulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhā'ulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhā'ulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kaua'i community.

Regional Water Demand: The adjacent, developed Kōloa-Po'ipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kaua'i will increase county-wide by 17,300 residents by 2030. The South Kaua'i population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kaua'i region (the Kōloa - Po'ipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhā'ulepū Surface

Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhāʻulepū watershed.

The HDF site is located on the bottom-land of the upper Māhāʻulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Haʻupu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhāʻulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kauaʻi Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhāʻulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhāʻulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhāʻulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Po'ipū region were also calculated. Nitrogen input to the marine environment in the Po'ipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Po'ipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kaua'i community.

ALTERNATIVES: As a part of the DEIS, alternatives were evaluated that could attain the objectives of the action's purpose and need, and were compared with environmental benefits, costs, and risks of each reasonable alternative against those of the proposed dairy project. Further discussion of alternatives can be found in DEIS Section 6.

The DEIS evaluates alternatives that could attain the objectives of the action's purpose and need, and compares environmental benefits, costs, and risks of each reasonable alternative against those of the proposed action. Additionally, reasonable land use alternatives that emerged from public input during the project scoping phase are documented and briefly discussed. The alternatives that do not meet the project purpose are not advanced for analysis of environmental benefits,

costs, and risks. The Environmental Impact Statement Rules, Hawai'i Administrative Rules Chapter 11-200 (HRS 11-200) requires a discussion of alternatives that could attain the objectives of the action, regardless of cost. There is no requirement for the alternatives analysis to consider every possible land use.

Four possible land uses that would not meet the project purpose are discussed. Rezoning the land for resort or residential development, or a potential conservation condemnation are two uses that were examined and eliminated from analysis. These options would not be reasonably viable given the existing private land tenure and existing zoning. Two additional alternatives were considered as reasonable land uses as they could be permitted within the existing State Land Use Agricultural District and County Agricultural Zoning District. These options include Agricultural Park with Processing Center, and development of an Agricultural Subdivision. The alternatives were examined and eliminated from further analysis, however, as they would not fulfill the project purpose.

The analysis, therefore, focuses on alternatives that meet the project purpose. Rigorous exploration and evaluation of the environmental impacts of the alternatives, including those that might enhance environmental quality or avoid, reduce or minimize some or all of the adverse environmental effects, costs and risks. These alternatives include: (1) the development of a Conventional Feedlot Dairy (a non-pasture-based dairy) at the same location; (2) development of the Pasture-Based Dairy at an Alternative Location on Kaua'i; and (3) milk products processing by HDF. The alternative of "No Action" is also evaluated.

The alternatives analysis provides a comprehensive evaluation of the range of potential alternatives, including the two alternative development scenarios. Although the alternatives are potentially reasonable uses under existing zoning and neighboring uses, each fails to comprehensively fulfill the project requirements defined by the eight Project Objectives and the four established Evaluation Criteria (Chapter 2, Sections 2.3.3 and 2.3.4).

The essential differences as compared to the proposed action are highlighted in the following statements.

- Only one of the alternative actions (conventional feedlot alternative) would create a commercial scale dairy operation in Hawai'i, with the capability to produce 10 percent of the State's fresh milk demand thus reducing dependence on imported milk (Objective 1). This alternative, however, would not reduce reliance on costly imported fertilizer and feed (Objective 2); grow local, quality grass as a primary feedstock (Objective 3); and would not utilize 100 percent of manure on site as nutrients to grow forage for dairy cows (Criterion 4).
- None of the alternatives would secure a dairy location that meets the requirements for a pastoral, pasture-based grazing dairy: sufficient contiguous land area; available long-term land tenure; adequate potable water supply; suitable soil properties; gentle slope conditions; and accessibility (Criterion 1).
- One alternative (Agricultural Park) could potentially generate new long-term

employment in the agricultural sector on Kaua'i in a wide range of positions including pasture agronomy/soils science, environmental resources management (Criterion 2).

- The Agricultural Park alternative could also develop sustainable food production utilizing Important Agricultural Lands, demonstrating the importance of long-term agricultural leases and capital investment for agricultural infrastructure, water systems and support facilities. (Criterion 3). However, after years of trying, it appears there was limited interest in such a venture.
- Finally, addressing the range of potential environmental impacts (natural, cultural, social and economic) (Objective 8) the two alternative development scenarios would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.

In contrast to the other options considered, the planned agricultural operation of Hawai'i Dairy Farms, was determined to be the most viable option and is the preferred alternative. Of all the alternatives considered, this is the only approach that achieves project objectives and meets each of the four Evaluation Criteria.

- Hawai'i Dairy Farms will create a commercial scale pasture-based dairy operation in Hawai'i, with the capability to provide more than 1,000,000 gallons of the fresh milk demand, reducing dependence on imported milk (Objective 1).
- The planned dairy location meets the requirements of minimum land area, soil properties, slope conditions, water supply, land tenure and availability, and accessibility (Criterion 1).
- The planned action will generate new long-term employment in the agricultural sector on Kaua'i, including pasture agronomy/soils science, veterinary and animal husbandry, environmental resources management, milk/milk processing, and dairy business management (Criterion 2).
- Sustainable food production utilizing Important Agricultural Lands (Criterion 3) will occur with the proposed action, demonstrating the importance of long term agricultural leases, and the ability to draw capital investment for agricultural infrastructure including water systems and support facilities (Criterion 3).
- Address the range of potential environmental impacts by utilizing 100 percent of manure as natural fertilizer to grow the majority of food for cows (Criterion 4). The alternatives evaluated would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.
- Creating an economically viable pasture rotational-grazing model maintains agriculture, retains open space, and provides buffer between highly utilized resort and residential development and sensitive natural or cultural resources (Objective 8).

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

Masai Bell
1960 Nana Pali Rd
Lihue HI 96766

RECEIVED

FEB 24 2015

GROUP 70 INTL

February 21, 2015

Laura McIntyre
State of Hawaii Dept of Health
1250 Punchbowl Street
Honolulu HI 96813

Group 70 International
925 Bethel Street 38th Floor
Honolulu HI 96813

Jeff Overton
Hawaii Dairy Farms
PO Box 1690
Koloa HI 96756

RE: Hawaii Dairy Farms Environmental Impact Statement Preparation Notice dated January 2015

Dear Ms McIntyre,

I was born on Kauai. My son Isaiah was born on Kauai two years ago today. My son suffers from asthma. The air pollution from a dairy of any size will cause respiratory harm to my son. My son's mother works in a Poipu restaurant downwind of the proposed dairy site.

We are concerned about my son's health and our economic welfare if a dairy operates north east of Poipu. How will we pay our mortgage payment if my girlfriend's income falls? Who will come into her open air restaurant to order food if all they can smell is terrible dairy cow odor.

The certain air pollution and economic harm caused by an industrial dairy in Mahaulepu valley all need to be addressed and answered by the EIS.

Sincerely,

Masai Bell

GROUP 70
INTERNATIONAL

May 26, 2016

Masai Bell
1960 Nana Pali Road
Lihue, HI 96766

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Masai Bell:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

DEMOGRAPHIC AND ECONOMIC: The potential impacts of Hawai'i Dairy Farms (HDF) to the existing economy were evaluated in the Draft Environmental Impact Statement (EIS), including a fiscal impact assessment report completed in April, 2016 by Plasch Economics Pacific. Draft EIS Section 4.15 addresses demographic and economic factors, with the complete report in Appendix J.

The HDF project would create short-term benefits through jobs for local construction personnel and local material suppliers. Such jobs would include equipment operators, cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, supervisors, painters, etc. Based on State employment multipliers, indirect employment related to Dairy construction would be expected to average about 16 jobs on Kaua'i, and 8 on O'ahu. Construction employment would be expected to average about 12 jobs per year during the

development period. Thus direct-plus-indirect employment association with construction would be expected to average approximately 36 jobs, of which 28 would be on Kaua'i.

The HDF project would contribute to diversification of Kaua'i's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Hawai'i Island), approximately10 percent of Hawai'i's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and indirect full-time equivalent jobs on Kaua'i, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on O'ahu.

HDF is expected to generate a net income of approximately $68,000 to the County when the 699 cow herd is established. When the dairy has matured to full production for the 699 cow dairy, net income to the State is calculated at $160,000 annually. With the potential contemplated herd size of up to 2,000 mature dairy cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be produced. This would double local milk production currently supplied by operational dairies on the Island of Hawai'i.

Additional employment generated by a possible expansion to accommodate the contemplated 2,000 mature dairy cow herd is estimated at approximately 3 construction jobs plus 4 indirect jobs on Kaua'i, and 2 indirect jobs on O'ahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an additional 5 full-time farm jobs would be added, with approximately 15 additional indirect jobs on Kaua'i and another 8 indirect jobs on O'ahu.

The dairy is expected to generate a net additional contribution to the County of approximately $8,000 for improvements related to expansion for the contemplated herd size of up to 2,000 mature dairy cows ($76,000 total versus $68,000 for the committed herd size). The State will derive approximately $360,000 annually in revenues from the contemplated 2,000-mature dairy cow dairy.

Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

AIR QUALITY: As a part of the Environmental Impact Statement (EIS), existing air quality conditions and project impacts were evaluated, including dust and odor. Potential odors and emission levels for air pollutants relevant to dairy operations were modeled, as currently there are no cows on site. EIS sections 4.19 and 4.25 provide an evaluation of air quality and odors, including a windrose depicting wind

speed and direction in the area (see DEIS Section 4.1, Climate). The full air quality technical report can be found in Draft EIS Appendix I.

Clean Air Act

Under the *Clean Air Act of 1970* (CAA), amended November 1990, the U.S. Environmental Protection Agency (EPA) regulates both large and small sources of air pollutants by establishing National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. The State of Hawai'i has established its own *State Ambient Air Quality Standards* (SAAQS) that are as strict or, in some cases more strict than the NAAQS. State standards prohibit any visible emissions of fugitive dust from construction activities at the property line.

Emissions relevant to livestock operation include particulate matter and fugitive dust. Greenhouse gases related to dairy cows include methane (CH_4) from enteric fermentation, and both methane and nitrous oxide (N_20) emissions from manure application. No State or Federal regulations for greenhouse gas emissions from farm operations or small businesses currently exist.

DUST

Dust will be generated as cows move along soft limestone walkways that connect the paddocks and lead to and from the milking parlor. Potential fugitive dust emission rates were estimated from published literature, where particulate matter (PM) is measurable from the "drylots" of confined dairy operations where animals walk over dirt and dried manure throughout the day.

Applying the emission rates from this available literature greatly overestimates potential emission resulting from HDF. Cows in the pastoral rotational-grazing system will be on pasture 22 hours each day and will spend two hours – in two separate milking cycles –moving to and from the barn for the 10- to 15-minute milking sessions.

Using atmospheric dispersion modeling system (AERMOD), the rates were scaled to the size of the non-pasture areas used by cows at HDF. Results were added to the background concentration of particulate matter (both PM_{10} and $PM_{2.5}$) measured on the island of Kaua'i, and the total concentration was compared to the State ambient air quality standards. Only the contemplated herd size of up to 2,000 mature dairy cows was modeled, as at the lower threshold of 699 cows, the potential fugitive dust impact would be negligible. The estimated concentration for PM_{10} is 2.01 $\mu g/m^3$, well below the State standard of 150 $\mu g/m^3$. The estimated concentration for $PM_{2.5}$ is 0.23 $\mu g/m^3$, well below the Federal standard of 35 $\mu g/m^3$ (see Draft EIS Section 4.19 and Table 4-19.2).

ODOR

Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF, so air dispersion models were used to determine potential odor levels. Local weather data was used in conjunction with the AERMOD modeling

system, and published rates for manure odors emissions for dairy heifers and effluent ponds were adapted to reflect the HDF facilities.

Odor emission sources identified for modeling at HDF were manure in the pasture fields, irrigation water containing diluted nutrients from effluent, the effluent storage ponds, and the dairy buildings. Odor rates from published research were applied. Odor isopleths (a line used to map all points having the same numerical value) were created to display the model findings. Odor is described in "odor units" at the threshold of perception, which is defined by the point at which 50 percent of panelists, in laboratory conditions, cannot smell the odor but 50 percent of the panelists can detect the odor.

Modeling results were generated for worst case meteorological conditions (low wind velocity / mixing). Generally, tradewinds will disperse odors to less than detectable levels beyond the HDF site; in periods of no wind, odor may not be dispersed creating the "worst case" scenario. In these periods without normal tradewind flow, the odor plume would extend to the south of the HDF site. Sections 4.19.2 and 4.25.2 of the EIS include graphics of the potential odor isopleths.

Results for the committed herd size of 699 mature dairy cows show that odors may be detectable by 50 percent of the sensitive population once per 200 hours, or 44 hours per year, within an area that extends approximately 1,670-feet (within one-third of a mile) beyond the dairy farm boundary, and does not reach recreational or residential areas. Results for the contemplated expanded herd size of up to 2,000 mature dairy cows show odors would not extend beyond 2,780 feet outside the HDF boundary (just over half a mile), again not reaching recreational or residential areas, and again with detection limited to 50 percent of the sensitive population approximately 44 hours per year. The parameters used in the analysis were intentionally conservative, and the impacts shown assume an unlikely confluence of worst-case meteorological data, irrigation location, and grazing location. Actual offsite odor impacts are likely to be much lower and/or less frequent than shown; it is likely odor detection beyond the HDF boundaries will be less frequent.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI
Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

February 22, 2015

Laura McIntyre
State of Hawaii-Department of Health
1250 Punchbowl St
Honolulu, HI 96813

Re: Proposed Hawaii Dairy Farms Environmental Impact

I am writing to express my opposition to the proposed location of HDF's operation in the Mahaulepu Valley, Kauai. Please add me to the growing list of concerned south shore residents that need to be kept informed of the status of the state's actions regarding HDF.

The proposed dairy farm is adjacent to the ocean, an environmentally sensitive area, already identified as an area that needs substantial remediation to achieve eco balance.

The dairy would substantially affect the economic and social welfare and public health of the community with negative impact to tourism, degradation of a pristine and culturally relevant historical site, and with harmful pollution to water tables, streams and the ocean evident.

The state needs to carefully assess this project as to the effects of public health and possible degradation of environmental quality. I am counting on your agency to effectively administer the EIS that will demonstrate that this plan is ill conceived in the current planned location.

Mahalo for your attention to this matter,

Sincerely,

Roger Bishop
1172 Pua Mellia St.
POB 173
Kalaheo, HI 96741-0173
808-320-3783
roger_bishop@yahoo.com

May 26, 2016

Roger Bishop
roger_bishop@yahoo.com

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Roger Bishop:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

Your comments were received by the State of Hawai'i Department of Health Environmental Planning office. The Department of Health forwarded a copy of your comments to Group 70 International in order to be included in the Draft Environmental Impact Statement (EIS) analysis. This letter was prepared in response to your comments.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

DAIRY OPERATIONS: Hawai'i Dairy Farms (HDF) will establish and operate a sustainable, pastoral rotational-grazing dairy farm in Māhā'ulepū Valley on the island of Kaua'i to produce fresh, locally available nutritious milk for Hawai'i families. The rotational-grazing method utilizes 100 percent of the cows' manure as natural fertilizer to grow pasture grass as a primary source of nutrition for dairy cows. This cost-effective method will reduce reliance on imported fertilizer and feed. Pasture grass will comprise at least 70 percent of the animals' diet. As a part of

the Draft Environmental Impact Statement (EIS), the proposed facilities and operations for the dairy farm are described in Chapter 3.

The Environmental Impact Statement (EIS) Preparation Notice (EISPN), published January 23, 2015, described the proposed pasture-based rotational grazing system as a "zero-discharge, grass-fed dairy". The term "zero-discharge" under the U.S. Environmental Protection Agency related to concentrated feeding operations (CAFO) is a system designed to not discharge pollutants into waters of the United States. As noted previously, the HDF system is designed to utilize 100 percent of the cows' manure on-site. However, nutrients would be introduced to the HDF site with any use; the Draft EIS identifies the amount of nutrients anticipated from the proposed dairy operations that could pass through to ground and surface waters. Therefore, HDF elected to discontinue use of the term "zero discharge" as it was construed as no nutrients into the system.

The term "grass-fed" was used in the HDF EISPN. This term was used to identify HDF's intent to utilize a locally-produced feedstock – grass – for more than 70 percent of the dairy herds' diet. In January 2016, the U.S. Department of Agricultural (USDA) Marketing Survey created a narrow legal definition of "grass-fed". The USDA standard defines what animals can and cannot be fed. The Food Alliance, a project of several northwest colleges, believes that when consumers choose grass-fed products there is an expectation that these will come from animals raised on pasture on a forage-based diet. Due to the evolving definition of "grass-fed", the term in not used in this EIS.

The dairy facilities will occupy an area of approximately 10 acres on the western boundary of the site. The developed area "footprint" will be less than 2 percent of the total farm area. Four buildings will be constructed to serve different functions, supported by utilities and infrastructure. Additional building information can be found in Draft EIS Section 3.3.1.

Agricultural infrastructure and utilities required for the dairy operations will include storage tanks and silos, effluent storage ponds, livestock water systems, and drainage improvements. The irrigation system and distribution of livestock water are discussed in Draft EIS Section 3.5, Pasture Management.

The pastoral rotational-grazing dairy provides a local feedstock – grass – as the herd's primary food source. Reducing imported feed stabilizes costs and provides a food source closer to the natural diet of cows. Results of grass trials initially conducted at five sites across four Hawaiian Islands were instrumental in identifying appropriate varieties of grass, and suitable sites to support sufficient "dry matter" grass yields essential to a cow's diet. Additional project-specific trials at the Māhā'ulepū site on Kauai have been conducted for more than 18 months. The results have identified sufficient yield and nutrition to supply 70 percent of the cows' diet; improvements in grass productivity are anticipated to provide up to 85 percent of cows' diet.

The pasture-based model allows cows to move about freely, and to lie down and rest, which is part of the digestion cycle. The animals are managed in social groups

known as "mobs", mimicking the natural social order of bovines. Cows spend 22 hours of each 24-hour period foraging on pasture or resting, outdoors in natural light and fresh air. The gently sloped paddocks, walkways and races minimize the energy expended by the mature dairy cows as they graze or are transferred to and from the various paddocks and the mature dairy facility; surfaces of the walkways and cow races are designed to provide a comfortable path under hoof. The management practices and pasture model applied by HDF maximizes grass as the cows' primary nutrition source and minimizes stress to the animals. Cows tend to be healthier and live longer, productive lives with access to fresh air, high quality feed, and exercise while they forage.

The 470 acres of pasture will be divided into paddocks averaging 3 to 5 acres in size. Smaller paddocks located near the dairy facility will be used as temporary pasture for cows or calves being moved on or off the farm. To protect the water quality of surface water and downstream areas, paddock fences are set back 35 feet from the edge of drainage ways throughout the site. Existing vegetation within the setbacks will be managed or restored to reduce erosion, improve stability of ditch banks, increase net carbon storage, and improve and maintain water quality.

The majority of the pastures will be irrigated with non-potable water and/or diluted effluent through either the pivot irrigation systems or through gun irrigators. Irrigation water supply is provided to the farm from Waita Reservoir, and will be filtered and pumped to the various irrigation components on the farm. The irrigation system is controlled using computer software and GPS receivers to allow very precise application of irrigation and/or diluted effluent on the pasture. The pivots can rotate and apply irrigation water and/or diluted effluent at different rates depending on the actual irrigation needs of the farm.

NRCS provides technical guidance on applying agricultural waste depending on the desired use of the waste. Reflected in the title of the livestock waste guidance for Hawai'i is the parenthetical inclusion of the word "nutrients." Where waste is utilized as a resource, it is being used for the constituent components that provide benefit.

The NRCS Conservation Practice Standard 590, Nutrient Management, applies to commercial fertilizers, organic by-products, waste water, organic matter, and irrigation water. Nutrient management is the practice of managing the amount, rate, source, method of application, and timing of plant nutrients and soil amendments. The timing and application of nutrients will correspond with plant uptake, soil properties and weather conditions. For more information on nutrient balance management see Draft EIS Section 3.5.3, and Draft EIS Appendix D.

The effluent storage ponds are sized to accommodate 30 days of storage for up to 2,000 mature dairy cows, and over 85 days of storage for 699 mature dairy cows. It will be highly unlikely that the storage pond will be full at any time for the contemplated 2,000-cow dairy, and nearly impossible for the committed 699-cow dairy. Throughout the less than 30-day storage period, effluent is planned for application every four days, and the slurry application is expected at least once every 45 days, to ensure that the ponds are kept at manageable levels.

Cows lactate milk following the birth of calves. Newborn calves will be housed on the Māhā'ulepū site and provided essential colostrum and nutrients for a healthy start. During the calves' initial 90 days, they will be transitioned to pasture at HDF before transfer to ranches on Kaua'i to be raised off-site. The committed herd size of 699 mature dairy cows at the Māhā'ulepū site applies to mature mature dairy cows. Animals in various stages of lactation and rest will be transferred between HDF and other partner ranches as needed for animal health and dairy productivity. This will benefit both the dairy and infuse the beef market in Hawai'i with a new, local source of pasture-raised calves. Male calves will become part of the beef cattle herd; heifers (young female calves that haven't given birth) will be raised until ready to return to the HDF herd as a birthing/mature dairy cow. For more information on off-site herd management, refer to Section 3.7 of the Draft EIS.

Health of the herd is of primary importance as the success of a dairy relies on cows effectively producing quality milk. All cows will be treated with a high standard of care. Dairy managers and caretakers will be trained and competent in handling animals to minimize stress and ensure the herds' welfare. A licensed veterinarian may prescribe use of antibiotics approved by the Food & Drug Administration (FDA) for treatment of illnesses. Adherence to guidelines that prohibit milk from cows undergoing antibiotic treatment will ensure no adulteration of milk. Routine laboratory tests of milk for traces of antibiotic residue will be conducted. HDF will not inject cows with bovine growth hormone, referred to as rBST or rBGH.

ARCHAEOLOGICAL AND CULTURAL: The Hawai'i Dairy Farms (HDF) project is subject to a historic preservation review by the State Department of Land and Natural Resources, State Historic Preservation Division (SHPD) under HRS Chapter 6E and Chapter 13-284. An Archaeological Inventory Survey (AIS) and a Cultural Impact Assessment (CIA) were conducted by Scientific Consultant Services (SCS) for the proposed project. EIS Sections 4.7 and 4.8 provide an evaluation of archaeology and cultural resources, with technical studies in Appendix G and H.

A total of sixteen historic properties were identified through a pedestrian survey of the project area and an extended survey area of 100 meters of the northern boundary. Six historic-era sites occur in the project area and 10 sites occur in the extended survey area. Only one of the sites is believed to be associated with pre-Contact and/or early historic times. State Site 50-30-10-2250, the agricultural heiau, and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area. The remaining sites consist of historic-era bridges, ditches, culverts, retaining walls, and a flume system dating from the 20th century and are affiliated with sugarcane cultivation.

That a majority of the documented sites are related to the historic-era is not surprising, given the massive landscape modifications that occurred during intensive sugarcane cultivation on the valley floor. Even historic era cultural materials associated with the many Land Commission Awards in the project area were non-existent, as explored through survey and subsurface exploration.

The sixteen historic properties have been assessed for significance by the archaeological consultant and the dairy project is anticipated to have no impact on these sites. No further archaeological work is recommended for the sites. Two of the sixteen sites are considered significant under multiple criteria, but occur outside the project area on lands owned by a different landowner. Both sites will not be adversely affected by the proposed dairy project. No site is related to burials, and no bonex were found. Such sites have been reported along coastal areas in sand dunes.

The cultural assessment examined the potential effect of the project on cultural resources, practices or beliefs, its potential to isolate cultural resources, practices or beliefs from their setting, and the potential of the project to introduce elements which may alter the setting in which cultural practices take place. Information received from the community indicates the Māhāʻulepū Ahupuaʻa, has been and is currently used for traditional cultural purposes. However, the dairy project area has not been included in these activities. It is clear that the gathered plants, trails, State Site 50-30-10-2250, the agricultural heiau, and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area.

The project will be fully enclosed by perimeter fencing along the boundary of the leased premises, which will ensure that project activities and any related impacts are contained within the project area. Based on the research and comments received from the community, it is reasonable to conclude that, pursuant to Act 50, the exercise of native Hawaiian rights or any ethnic group related to numerous traditional cultural practices will not be impacted by establishment of the dairy.

DEMOGRAPHIC AND ECONOMIC: The potential impacts of Hawai'i Dairy Farms (HDF) to the existing economy were evaluated in the Draft Environmental Impact Statement (EIS), including a fiscal impact assessment report completed in April, 2016 by Plasch Economics Pacific. Draft EIS Section 4.15 addresses demographic and economic factors, with the complete report in Appendix J.

The HDF project would create short-term benefits through jobs for local construction personnel and local material suppliers. Such jobs would include equipment operators, cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, supervisors, painters, etc. Based on State employment multipliers, indirect employment related to Dairy construction would be expected to average about 16 jobs on Kauaʻi, and 8 on Oʻahu. Construction employment would be expected to average about 12 jobs per year during the development period. Thus direct-plus-indirect employment association with construction would be expected to average approximately 36 jobs, of which 28 would be on Kauaʻi.

The HDF project would contribute to diversification of Kauaʻi's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Hawaiʻi Island), approximately10 percent of Hawaiʻi's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and

indirect full-time equivalent jobs on Kauaʻi, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on Oʻahu.

HDF is expected to generate a net income of approximately $68,000 to the County when the 699 cow herd is established. When the dairy has matured to full production for the 699 cow dairy, net income to the State is calculated at $160,000 annually. With the potential contemplated herd size of up to 2,000 mature dairy cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be produced. This would double local milk production currently supplied by operational dairies on the Island of Hawaiʻi.

Additional employment generated by a possible expansion to accommodate the contemplated 2,000 mature dairy cow herd is estimated at approximately 3 construction jobs plus 4 indirect jobs on Kauaʻi, and 2 indirect jobs on Oʻahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an additional 5 full-time farm jobs would be added, with approximately 15 additional indirect jobs on Kauaʻi and another 8 indirect jobs on Oʻahu.

The dairy is expected to generate a net additional contribution to the County of approximately $8,000 for improvements related to expansion for the contemplated herd size of up to 2,000 mature dairy cows ($76,000 total versus $68,000 for the committed herd size). The State will derive approximately $360,000 annually in revenues from the contemplated 2,000-mature dairy cow dairy.

Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawaiʻi Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhāʻulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa

series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhāʻulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Poʻipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhāʻulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawaiʻi Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhāʻulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhāʻulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhāʻulepū Valley, HDF

established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kauaʻi community.

Regional Water Demand: The adjacent, developed Kōloa-Poʻipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kauaʻi will increase county-wide by 17,300 residents by 2030. The South Kauaʻi population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kauaʻi region (the Kōloa - Poʻipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhāʻulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhāʻulepū watershed.

The HDF site is located on the bottom-land of the upper Māhāʻulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Haʻupu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhāʻulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and

prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kaua'i Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhā'ulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhā'ulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhā'ulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhā'ulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Po'ipū region were also calculated. Nitrogen input to the marine environment in the Po'ipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Po'ipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kaua'i community.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

From: Mehana Vaughan <mehanav@gmail.com>
Sent: Sunday, February 22, 2015 9:31 AM
To: epo@doh.hawaii.gov; HDF
Cc: greg@malamamahaulepu.org; blaich
Subject: Mahaulepu Dairy EISPN comments
Attachments: EISPN- Comments Blaich.pdf; EISPN- Comments Blaich.pdf

Aloha,
Thank you for this opportunity to comment on the EISPN for the HDF proposal.
Beryl Blaich
blaich@aloha.net

State of Hawai'i, Department of Health
Environmental Planning Office
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February 20, 2015

Dear Ms McIntyre:
Dear Mr. Overton:

I write to to register to be a consulting party for the Draft Hawai'i Dairy Farms Environmental Impact Statement.

I have significant concerns about the project's impact on the natural resources of Māhā'ulepū, particularly its ground and ocean water, air, and habitat for diverse endangered species. I fear that the dairy will irrevocably change the cultural essence of this area, which is a burial place. My overriding concern is that deleterious impacts of the dairy could foreclose the range of future beneficial uses of the environment of Māhā'ulepū, particularly its use as a natural park. Preservation as a park could bring greater economic, environmental and social benefits to the landowner, to the local and island community and to the State than the proposed project.

I am glad and grateful that HDF has decided to do an Environmental Impact Statement (EIS). I expect that the extensive questions and concerns that have been raised by the public for the past year about the proposed dairy will be thoroughly and scrupulously addressed and that, if needed, stringent mitigative measures will be implemented.

I am commenting as an individual whose gravitation to Māhā'ulepū is because of its beauty, simultaneously expansive yet intimate. While the ocean is ever stunning, and changing, the majestic constant presence of Hā'upu pervades Māhā'ulepū and its surroundings with calm. Whenever there, I leave refreshed by this strangely tangible tranquility. My experience is common.

I have been actively involved in Mālama Māhā'ulepū for fifteen years, and I have paid considerable attention to this proposal. This letter describes the history and

credibility of Māhā'ulepū conservation initiatives, offers suggestions on what the EIS must cover and provides comments on the EIS Preparation notice. .

I. History and Credibility of Maha`uelpu Conservation Initiatives

Non profit Mālama Māhā'ulepū works to protect the irreplaceable natural and cultural resources of Māhā'ulepū and to sustain the experience of the place as an undeveloped area with compatible agriculture, education, cultural practice and recreation. By "compatible" we mean that these different land uses must be able to co-exist without degrading each other.

It is imperative to conserve Māhā'ulepū not only because it is the last undeveloped coastal area of Kaua`i's South Shore, but because the collected resources at Māhā'ulepū offer an intact cultural landscape. Mālama Māhā'ulepū knows that conservation depends upon the willingness of the landowner and that Grove Farm Company must be compensated for any land or entitlements given to public purposes. Moreover, the group believes that conservation should be an ongoing collaborative and creative effort.

The significance of Māhā'ulepū has been officially recognized by government at the County, State and Federal levels, as well as by land trusts. In 1992, the Office of State Planning recommended expanding the conservation district to include 247 acres of coastal agricultural land as well as the slopes around three cinder cones Pa`a (Puu Wanawana, Puu Hunihuni and Pu`ihi) because of the area's geologic features as well as other natural and cultural resources. At that time, the Office of State Planning placed the area in a status of "land bank."

In 2000 the Kaua`i County General Plan stated: "This area needs a community-based planning effort that engages the landowner and local community interests, drawing upon the County government, the State DLNR, and various professional experts, as needed. Options for the area include some development in exchange for a park and or preservation areas. Or purchase of the land for a State park." (GP, 6.4.4.3)

In late 2000, Trust for Public Land explored the possibility of holding an option to purchase Maha`ulepu. In 2001, the County Council and the State Legislature passed resolutions calling for a collaborative process to explore preservation options for Māhā'ulepū. In 2001, Governor Cayetano attempted to purchase Māhā'ulepū to add to Hawai`i's "string of pearls" natural parks.

In 2008, the National Park Service, at the behest of Senator Inouye, conducted a reconnaissance survey of Māhā`ulepū and surrounding areas including Kīpū Kai, the coastal headlands as far as Nawiliwili, the Hulēia River including the Alekoko Fishpond and the Hulēia Fish and Wildlife Refuge. The study found that these areas together met the three criteria of significance to qualify for inclusion in the national park system and recommended the next level of NPS study. In 2013, Senator Brian

Schatz and Representatives Colleen Hanabusa and Tulsi Gabbard initiated bills to authorize a Special Resource Study, the next step of national park consideration.

Māhāʻulepū has been the most recommended place to protect in annual surveys to prioritize use of the County's Natural Resources, Public Access and Open Space Fund. The Hawaiian Island Land Trust has placed Māhāʻulepū on its list of Hawaii's most iconic landscapes, a priority for preseravation efforts should the landowner be willing. In short, conservation of Māhāʻulepū has been recommended by county, state and federal government agencies, conservation organizations and the public for over forty years, and is far more than a dream.

II. Needed EIS Content

Environmental Value
As it is – largely undeveloped, not urbanized - Maha`ulepu has public value. The valuable services nature provides humans, including ground water recharge, air and water purification, and maintenance of bio-diversity, are quantifiable and described as "natural capital." While food production is also certainly a critical benefit of nature's functioning, agriculture can also jeopardize other key services depending upon the kind, intensity, practices, location of the cultivation

I hope that the EIS will use the natural capital framework and methodology because it a) characterizes the existing state of the site and its surroundings and b) compares the impacts of alternative scenarios. Potential resources include Invest, a package of modeling software created by Stanford University scientists to assess the value of an area's natural capital while helping to analyze the impacts of different land uses on that area. Kamehameha Schools Bishop Estate utilized Invest to plan for the watershed of Punalu'u on ʻOʻahu and the software is currently being used to assess ecosystem service values of ahupuaʻa on both Kauaʻi and Hawaiʻi islands. (www.naturalcapitalproject.org). In addition, scientists at UH Mānoaʻs Department of Natural Resources and Environmental Management are creating other ecosystem services based decision support tools developed specifically for Hawaiʻi. (http://www.ctahr.hawaii.edu/nrem/staff/oleson.html).

Socio-Economic Benefits
Grove Farm Company generously allows daytime public access to Māhā`ulepū. It has become, intended or not, a defacto park and a substantial tourist attraction. Visitors frequently cite Māhāʻulepū as their favorite place on Kaua`i because they loved its undeveloped nature and felt they were discovering a special place. As is, Māhāʻulepū provides extensive social benefits.

The area is an outdoor museum, educational site, and place where stories of the past come alive. Visits to the Makauwahi Cave Reserve are an amazing educational

experience whether taking the self-guided or guided tours. School groups and service learning groups of all ages enjoy this on-going research and restoration site.

Māhāʻulepū is a source of physical and mental health. People hike the coast – many routinely – as individuals or in groups like Get Fit Kauai or Sierra Club. The Po`ipu Resort Association produced a coastal Māhāʻulepū Hike brochure with a map and text, promoted by all the area visitor accommodations. People also bike and ride horseback into Māhāʻulepū. People relish the wilderness experience of the area. For residents, it is an accessible tranquil retreat. Visitors say that Māhāʻulepū is the kind of natural experience they expected in Hawaiʻi. Artists and photographers relish the mountain to ocean panoramas, the contrast of beach and dunes with jagged limestone.

Economic Benefits
As is, Māhāʻulepū is an economic asset to the southshore and to Kaua`i. Creating a managed conservation area of sufficient size and vision to preserve the resources and natural sanctuary people now experience at Māhāʻulepū requires compensation to the landowner along with their vision and support. There would also be substantial monetary benefits to the landowner and to the community from preservation, including increased value of surrounding open space lands. The current costs of management, including liability, would be avoided.

In addition to providing diverse jobs on site, parks boost the overall economies of their surrounding areas. A National Parks Service study, released in March 2014, reported the that the 5.1 million visitors to Hawaiʻi's national parks spent more than $314 million on accommodations, food and activities. As of 2012, the park service employs 3723 people in Hawai`i. Kauaʻi currently does not have a national park. http://www.nature.nps.gov/socialscience/economics.cfm. However, Māhāʻulepū certainly does not have to become a national park in order to contribute significantly to Kauaʻiʻs economy. A range of other preservation possibilities would provide the same economic benefits.

Water and Air:
The dairy could substantially degrade air and water quality, negatively affecting both habitat and healthy human connection to this place. Substantial long term environmental degradation could foreclose preservation and enhancement of natural features of Māhāʻulepū such as native plants, wetland areas and habitat for Newell's and wedgetail shearwaters.

I am particularly concerned about the dairyʻs effects on both ground and sea water. The dairy could negatively impact drinking water quality and sufficiency. There is great potential for nutrient intrusion into the Kōloa aquifer, area springs, wetlands and ultimately into the Class A ocean waters. Māhāʻulepū is a loved fishing, diving and limu gathering place which Kauaʻi families depend upon for both physical sustenance and recreation.

The hydrological study of the EIS is critical to assessing compatibility of the dairy with the area's natural resources and cultural experiences. This hydrological study will need to model the watersheds of both Maha`ulepu and Pa'a. It should fully depict in maps, diagrams and text the water flows (inputs) into the valley (rains, streams, water from Waita), the water resources in the watershed (deep and shallow aquifers, subsurface flow, streams), and the outflows of water from the valley (streams, subsurface waters, springs, wetlands).

I am also concerned that the dairy will diminish the air quality of this region by greatly increasing greenhouse gases. Māhā'ulepū has been described – because of its facing into the tradewinds – as the place where Kaua'i takes its breath. Over eons. the prevalent winds created the sands dunes that have hardened into the distinctive eolinante limestone headlands sheltering fossils of animals and birds living here before native Hawaiians arrived. The dunes shelter burials, the most significant of Maha`ulepu's cultural resources. While legends offering reasons for the burials vary, respect for them dictates the tranquility and refuge-like nature of being at Maha`ulepu.

Economic Questions the EIS Should Answer
The financial outlay for this dairy - $13.8 million without an EIS- is large. Considerable financial analysis must underpin this investment. The EIS needs to disclose the full financial picture and business plans for the dairy. Questions include:

- Is HDF solely owned by Ulupono? Or are their multiple investors/partners as early stories about the dairy reported. Who are these entities?
- What are the specifics of the milk contract with Dean Foods/Meadow Gold Hawaii?
- What is the anticipated rate of return on investments over what period of time?
- What are the expected annual operating and maintenance costs of the dairy including the cost of boarding calves and resting cows with area ranc'ers.
- Are there already agreements with specific ranchers? Is HDF giving money to help improve a local slaughterhouse? This is a dairy cost as well as a possible benefit to Kaua'i.

- What is the expected price of the milk? Will there be a sufficient local market? Will milk be exported? The good goal of providing more local milk is only viable if local people can afford the product. Facing the dairy shelves in the market and given a choice between cheaper mainland milk, middle priced Hawai'i produced milk and more expensive mainland organic milk, which will people buy? Was a market study done? With surveys and consumer trend analysis? If so, it should be included in the EIS.

It is inadequate to say that the County of Kaua'i Important Ag Land process determined that 70,000 people will need 2 million gals of milk a day particularly as less families regularly drink milk.

III. Comments on the EIS Preparation Notice:

I have some small observations about the EISP which may affect the credibility of the document.

Definitions: Some of the basic terms used frequently to describe the proposed dairy, including "sustainable", "grass-fed and grass-based" and "zero-discharge," require clear definitions.

"Sustainable" sets very high standards in many minds. To be sustainable implies complete elimination of imported inputs such as feed, fertilizers and even sperm that will be used to impregnate the cows. Sustainable implies minimal use of natural resources, particularly water, with re-use and recycling of resources to create a closed system.

Similarly, "grass-fed" leads people to believe that the cows only food is pasture grass. "Zero-discharge" implies that there will be no pollutants entering the ground or the air, on the site and from the site.

If these understandings of the above words are not correct, clarification of HDF's definitions of the terms is needed up front in the EIS.

Is 'kikuyu-guinea" a variety of grass? Or does the hyphenation of the two types of grasses mean that the pastures will be comprised of both grasses?

The nutrient management plan only discusses the anticipated nutrient production and pasture fertilization regime for kikuyu. [Soil fertility Recommendations Table 15 p. 666 Waste management Plan, July 23, 2014} Will the EIS address the change to use of two pasture grasses?

"Long term" should be quantified. The dairy lease is for twenty years and while the dairy may or may not operate for that length of time, potentially detrimental effects of the dairy – particularly from infiltration of nitrogen, phosphorous and potassium into the soils – may occur even after the dairy is no longer in operation.

Inaccuracies, Simplifications, Deficiencies
Some of the EISPN statements are inaccurate, misleading and could reduce the credibility of the EIS if repeated in that document.

For instance, the statement that the proposed dairy is the "first grass-based" dairy" in Hawai`i is inaccurate. (This is repeated in all the summaries of the project.)

The Meadow Gold dairy at Moloa`a, Kaua`i was a grass-based operation as is the Mauna Kea Moo dairy in Hamakua on the Big Island.

The following statement is not accurate:
"Community concern over loss of agricultural land for another proposed resort on the last stretch of undeveloped Māhāʻulepū coastline prompted protection of 1,533 acres of agricultural lands under the Important Agricultural Lands (IAL) provision of the Hawaiʻi State Constitution (Article XI, Section 3).

In the late 1980s, there was community opposition to the development of the Po`ipu Bay Golf Course on "prime" agricultural lands. However, the State legislated IAL designation process did not occur until fifteen years later. Grove Farm, Co. chose to designate important ag lands rather than having those selected by the County. As supporters of diversified agriculture for Kauaʻi and Hawaiʻi and because of the importance of agriculture as a historic land use in Māhāʻulepū, Mālama Māhāʻulepū supported the IAL designation of lands in and near the watershed of Māhāʻulepū. We also expressed concerns about the use of IAL lands for cultivation of GMO seed research crops and their attendant use of pesticides and herbicides.

Section 3.2 page 3-3 states about half (1,203) of the homes in Po`ipu are "vacant". It is more correct to state that about half of the homes in Po`ipu are used for transient vacation rentals.

EISPN section 3.3 Infrastructure - Agricultural Operations states that the current "Conservation Plan covers agricultural use of these lands, approved by the West Kauaʻi Soil and Water Conservation District in December 2013." [p. 3-4] The Conservation Plan was inaccurate about the soil types of Māhāʻulepū and contained unacceptably sparse information about the dairy site and its surroundings. There was no area map, no topographical information and no discussion of the area's natural resources. The "plan" greatly alarmed the community. It would be better to simply state that there is going to be a revised Conservation Plan in the Draft EIS.

CONCLUSION:

In summary, I am anticipating an exceptionally thorough Draft EIS because of the importance of this special area and extensive and legitimate community concerns. My overriding concern is that deleterious impacts of the dairy could foreclose the range of future beneficial uses of the environment of Māhāʻulepū. This amazing place provides extensive benefits as is and could offer more to future generations.

Respectfully and with aloha,

Beryl Blaich
PO Box 1434
Kīlauea, HI 96754, 808-828-1438, 808-346-9589

GROUP 70 INTERNATIONAL

May 26, 2016

Beryl Blaich
P.O. Box 1434
Kilauea, HI 96754
blaich@aloha.net

Subject: Hawaiʻi Dairy Farms
Environmental Impact Statement Preparation Notice
Māhāʻulepū Road
Kauaʻi, Hawaiʻi
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Beryl Blaich:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

LAND USE: HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawaiʻi. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

The historical and existing land uses of the project site and surrounding Māhāʻulepū Valley were examined in the Draft Environmental Impact Statement (EIS), and uses proposed by the Hawaiʻi Dairy Farms (HDF) project were evaluated in the context of county and state land use designations for the area. The evaluation of land use is presented in Draft EIS Chapter 4.4, and the project's consistency with government plans and policies is presented in Draft EIS Chapter 5.0.

The south shore of Kauaʻi is home to some of the most productive farm land in the state, attributed to consistent sunshine, ample fresh water, and a large amount of Class A and B soils (with "A" representing the class of highest productivity soils and "E" representing the lowest). The large tracts of farmland, including those of

Mahaulepu Farm and Grove Farm, allow for stability in support of farm ventures, help maintain regional water systems and provide agricultural employment for Kaua'i residents in addition to fresh, local food.

The project site is on agricultural land in Māhā'ulepū Valley, an area with a long history of agricultural use as it was the first place in the island chain where sugarcane was commercially grown. The site is in the Agricultural District per State Land Use District designations, and per the County of Kaua'i zoning ordinance. The site consists of land classified as Prime per the State Department of Agriculture's Agricultural Lands of Importance to the State of Hawai'i (ALISH). The HDF site is outside of the County-designated Special Management Area under the Coastal Zone Management Program.

In 2005, the State established Important Agricultural Lands (IAL) by statute. The purpose of IAL is to conserve and protect agricultural lands, promote diversified agriculture, increase agricultural self-sufficiency and assure the availability of agriculturally suitable lands. The designation process determines land meet physical requirements including contiguous, functional land units large enough to allow flexibility in agricultural production near appropriate infrastructure and water, with high quality soil agricultural productivity ratings under the Land Study Bureau of University of Hawai'i.

In 2011, Mahaulepu Farm LLC filed a petition with the State of Hawai'i Land Use Commission to designate 1,533 acres of agricultural lands in Māhā'ulepū (including 557 acres that make up the HDF site) as IAL. IAL designation meets the objectives of the State HRS §205-42 by contributing to the maintenance of a strategic agricultural land resource base to support a diversity of agricultural activities and opportunities that expand agricultural income and job opportunities. See Figure 4.4-2 in DEIS Section 4.4.

The designation process determined that the land meets a number of physical requirements established in HRS §205-45, including contiguous, functional land units large enough to allow flexibility in agricultural production near appropriate infrastructure and water, with 88.5 percent of the area featuring an overall soil agricultural productivity rating of "B" per criteria established by the Land Study Bureau of University of Hawai'i.

The development and long-term operation of HDF will be in full compliance with its agricultural State Land Use District designation, ALISH classifications, and County zoning. The dairy farm will embody the intent of the IAL designation per the Hawai'i State Constitution, by using these protected lands for the intended purpose of diversified agriculture, food production and agricultural self-sufficiency. HDF development of a dairy also supports the "secondary intent" for lands in the Agriculture land designation, to provide an opportunity for Kaua'i citizens to reside in an agricultural community. This is in contrast to the described "agricultural subdivisions" that have changed parts of Kaua'i intended for a rural landscape, with development as quasi-suburban landscapes dotted with residences on large lots.

Overall, the project provides long-term benefit and support of agricultural lands and industry through continued use in keeping with zoning and IAL designation. Long-term operation of the dairy does not preclude the region for future protection in a coastal park at Māhā'ulepū.

DEMOGRAPHIC AND ECONOMIC: The potential impacts of Hawai'i Dairy Farms (HDF) to the existing economy were evaluated in the Draft Environmental Impact Statement (EIS), including a fiscal impact assessment report completed in April, 2016 by Plasch Economics Pacific. Draft EIS Section 4.15 addresses demographic and economic factors, with the complete report in Appendix J.

The HDF project would create short-term benefits through jobs for local construction personnel and local material suppliers. Such jobs would include equipment operators, cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, supervisors, painters, etc. Based on State employment multipliers, indirect employment related to Dairy construction would be expected to average about 16 jobs on Kaua'i, and 8 on O'ahu. Construction employment would be expected to average about 12 jobs per year during the development period. Thus direct-plus-indirect employment association with construction would be expected to average approximately 36 jobs, of which 28 would be on Kaua'i.

The HDF project would contribute to diversification of Kaua'i's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Hawai'i Island), approximately10 percent of Hawai'i's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and indirect full-time equivalent jobs on Kaua'i, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on O'ahu.

HDF is expected to generate a net income of approximately $68,000 to the County when the 699 cow herd is established. When the dairy has matured to full production for the 699 cow dairy, net income to the State is calculated at $160,000 annually. With the potential contemplated herd size of up to 2,000 mature dairy cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be produced. This would double local milk production currently supplied by operational dairies on the Island of Hawai'i.

Additional employment generated by a possible expansion to accommodate the contemplated 2,000 mature dairy cow herd is estimated at approximately 3 construction jobs plus 4 indirect jobs on Kaua'i, and 2 indirect jobs on O'ahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an additional 5 full-time farm jobs would be added, with approximately 15 additional indirect jobs on Kaua'i and another 8 indirect jobs on O'ahu.

The dairy is expected to generate a net additional contribution to the County of approximately $8,000 for improvements related to expansion for the contemplated herd size of up to 2,000 mature dairy cows ($76,000 total versus $68,000 for the committed herd size). The State will derive approximately $360,000 annually in revenues from the contemplated 2,000-mature dairy cow dairy.

Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhā'ulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhā'ulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Po'ipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhā'ulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawai'i Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhā'ulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhā'ulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhā'ulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kaua'i community.

Regional Water Demand: The adjacent, developed Kōloa-Po'ipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kaua'i will increase county-wide by 17,300 residents by 2030. The South Kaua'i population is estimated to reach 16,855 in 2035, when it is projected to

encompass 19.2 percent of the County population. For the South Kaua'i region (the Kōloa - Po'ipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhā'ulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhā'ulepū watershed.

The HDF site is located on the bottom-land of the upper Māhā'ulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Ha'upu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhā'ulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kaua'i Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhā'ulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhā'ulepū and adjacent watersheds. DOH conducted water sampling

within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhā'ulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhā'ulepū will carry three

times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Poʻipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring

program will be shared with the DOH CWB, dairy neighbors and the local Kauaʻi community.

AIR QUALITY: As a part of the Environmental Impact Statement (EIS), existing air quality conditions and project impacts were evaluated, including dust and odor. Potential odors and emission levels for air pollutants relevant to dairy operations were modeled, as currently there are no cows on site. EIS sections 4.19 and 4.25 provide an evaluation of air quality and odors, including a windrose depicting wind speed and direction in the area (see DEIS Section 4.1, Climate). The full air quality technical report can be found in Draft EIS Appendix I.

Clean Air Act

Under the *Clean Air Act of 1970* (CAA), amended November 1990, the U.S. Environmental Protection Agency (EPA) regulates both large and small sources of air pollutants by establishing National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. The State of Hawaiʻi has established its own *State Ambient Air Quality Standards* (SAAQS) that are as strict or, in some cases more strict than the NAAQS. State standards prohibit any visible emissions of fugitive dust from construction activities at the property line.

Emissions relevant to livestock operation include particulate matter and fugitive dust. Greenhouse gases related to dairy cows include methane (CH_4) from enteric fermentation, and both methane and nitrous oxide (N_20) emissions from manure application. No State or Federal regulations for greenhouse gas emissions from farm operations or small businesses currently exist.

DUST

Dust will be generated as cows move along soft limestone walkways that connect the paddocks and lead to and from the milking parlor. Potential fugitive dust emission rates were estimated from published literature, where particulate matter (PM) is measurable from the "drylots" of confined dairy operations where animals walk over dirt and dried manure throughout the day.

Applying the emission rates from this available literature greatly overestimates potential emission resulting from HDF. Cows in the pastoral rotational-grazing system will be on pasture 22 hours each day and will spend two hours – in two separate milking cycles –moving to and from the barn for the 10- to 15-minute milking sessions.

Using atmospheric dispersion modeling system (AERMOD), the rates were scaled to the size of the non-pasture areas used by cows at HDF. Results were added to the background concentration of particulate matter (both PM_{10} and $PM_{2.5}$) measured on the island of Kauaʻi, and the total concentration was compared to the State ambient air quality standards. Only the contemplated herd size of up to 2,000 mature dairy cows was modeled, as at the lower threshold of 699 cows, the potential fugitive dust impact would be negligible. The estimated concentration for PM_{10} is 2.01 $\mu g/m^3$, well below the State standard of 150 $\mu g/m^3$. The estimated concentration for $PM_{2.5}$

is 0.23 μg/m³, well below the Federal standard of 35 μg/m³ (see Draft EIS Section 4.19 and Table 4-19.2).

ODOR

Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF, so air dispersion models were used to determine potential odor levels. Local weather data was used in conjunction with the AERMOD modeling system, and published rates for manure odors emissions for dairy heifers and effluent ponds were adapted to reflect the HDF facilities.

Odor emission sources identified for modeling at HDF were manure in the pasture fields, irrigation water containing diluted nutrients from effluent, the effluent storage ponds, and the dairy buildings. Odor rates from published research were applied. Odor isopleths (a line used to map all points having the same numerical value) were created to display the model findings. Odor is described in "odor units" at the threshold of perception, which is defined by the point at which 50 percent of panelists, in laboratory conditions, cannot smell the odor but 50 percent of the panelists can detect the odor.

Modeling results were generated for worst case meteorological conditions (low wind velocity / mixing). Generally, tradewinds will disperse odors to less than detectable levels beyond the HDF site; in periods of no wind, odor may not be dispersed creating the "worst case" scenario. In these periods without normal tradewind flow, the odor plume would extend to the south of the HDF site. Sections 4.19.2 and 4.25.2 of the EIS include graphics of the potential odor isopleths.

Results for the committed herd size of 699 mature dairy cows show that odors may be detectable by 50 percent of the sensitive population once per 200 hours, or 44 hours per year, within an area that extends approximately 1,670-feet (within one-third of a mile) beyond the dairy farm boundary, and does not reach recreational or residential areas. Results for the contemplated expanded herd size of up to 2,000 mature dairy cows show odors would not extend beyond 2,780 feet outside the HDF boundary (just over half a mile), again not reaching recreational or residential areas, and again with detection limited to 50 percent of the sensitive population approximately 44 hours per year. The parameters used in the analysis were intentionally conservative, and the impacts shown assume an unlikely confluence of worst-case meteorological data, irrigation location, and grazing location. Actual offsite odor impacts are likely to be much lower and/or less frequent than shown; it is likely odor detection beyond the HDF boundaries will be less frequent.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

Alison K. Blessing
Robert L. Breckenridge
1610 Makanui Road
Koloa, HI 96756

February 11, 2015

VIA REGISTERED MAIL

State of Hawai'i
Department of Health
1250 Punchbowl Street
Honolulu, HI 96813

VIA REGISTERED MAIL

Group 70 International, Inc.
925 Bethel Street
5th Floor
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VIA REGISTERED MAIL

Hawai'I dairy Farms, LLC
P.O. Box 1690
Koloa, HI 96756-1690

RE: RESPONSE TO PROPOSED ENVIRONMENTAL IMPACT STUDY

To all whom it may concern,

We reside at 1610 Makanui. Our home is located very close to the southern most point on Kauai at Poipu. We are approximately 1-½ miles from the proposed Dairy Farm as the crow flies. The proposed Dairy Farm will negatively impact our property value, and ability to enjoy the outdoors. Additionally, it will contaminate the air with stench from the cows waste and manure.

First, due to our close proximity to the Dairy Farm we will necessarily be impacted by the biting flies, which will originate from the proposed number of cows on the acreage. This is an issue, which is not addressed, in the proposed EIS. However, this will occur and it will eliminate our ability to sit outside during the day and evenings without being bitten.

The odor and stench from 2,000 cows which will generate 200,000 pounds of manure and 16,000 gallons of urine on clay soil each day will further decrease our enjoyment of our land. The impact of the odor is also not addressed by the proposed EIS but will occur, will impact our enjoyment of our land and will also negatively impact property values.

We both enjoy the use of our lanai and swimming pool; but odor and biting flies will curtail this use or our property and cause us to be driven inside.

Further, the foregoing will drive our property value down as the reason we purchased the property was to enjoy the outdoors, the pool, gardening and these pursuits will be cumbersome if we have to dress to avoid being bitten by biting flies or wear masks to avoid the stench from the cows waste. Potential purchasers of the property will look elsewhere as no one comes to Kauai to cover up to avoid being bitten by flies and smell foul odors.

These same factors will also directly and negatively impact the tourist industry on the South Side of Kauai. A prime example of this is the loss of conventions already experienced by the Grand Hyatt.

On a broader scale, the proximity of the Koloa drinking wells to the Dairy Farm and the strong probability of contamination to that drinking water if the Dairy Farm proceeds with its plans places the health of the entire community at risk. I recognize that the Dairy Farm does not want to acknowledge that in Kauai we do have days and nights of heavy rain fall because it does not fit within the perameters of their proposed plan, but all of us who live here know that this occurs. When it does, the drinking water of the residents will be contaminated.

Independent experts have already determined that the Maha'ulepu soil is primarily non-absorbent clay and that the manure and urine from the cows will naturally flow into the watersheds and the ocean, but again the proposed EIS declines to consider these facts from independent scientists.

The Hawai'i Dairy Farm's Position that its presence will not negatively affect the community is not well considered. Employees of the Hyatt who have lost their jobs would "beg to differ." Due to the cancellation of conventions at the Grand Hyatt, when word of the proposed Dairy Farm became news, employees lost their jobs. The Hawai'i Dairy Farm is already adversely impacting our community.

Finally, there are many alternate locations where this project could occur which would not have the direct and negative impact that it will have with its proposed current placement at Maha'ulepu. It is baffling that the Hawai'I Dairy Farm continues to strong-arm a community when the scientific evidence of its negative impact on the community is so grossly overwhelming.

Your consideration of the foregoing is critical to a long established way of life on Kauai.

Sincerely,

Alison K. Blessing

Robert L. Breckenridge

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Alison K. Blessing & Robert L. Breckenridge
1610 Makanui Road
Koloa, HI 96756

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Alison K. Blessing & Robert L. Breckenridge:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

SOILS: Soil is an ecosystem that can be managed to provide nutrients for plant growth, to absorb and hold rainwater for use during dryer periods, to filter and buffer potential pollutants from leaving fields, to serve as a firm foundation for agricultural activities, and to provide habitat for soil microbes to flourish and diversify to keep the ecosystem healthy. Two rounds of independent soil sampling were undertaken at HDF to understand and characterize available soil nutrients and conditions. Section 4.3 of the Environmental Impact Statement (EIS) characterizes soil conditions, and anticipated impacts from effluent and supplemental nutrient application. Recommendations from Dr. Russell Yost and Nicholas Krueger of the University of Hawai'i at Mānoa are summarized. Their baseline nutrient report is included as Appendix C of the Draft EIS.

Soil conservation is a core principal behind establishment of the NRCS, which was formed out of the Soil Conservation Service to acknowledge its expanded role in watershed-scale approach using science-based tools and standards in agronomy, engineering economics, wildlife biology and other disciplines to aid landowners in implementation of conservation practices. NRCS conservation practices are listed in Chapter 3, Section 3.2; these practices codes identify design and construction standards related to drainage, materials, operations and applicable engineering standards. HDF will follow the developed Conservation Plan, which was approved by the West Kaua'i Soil & Water Conservation District in December, 2013.

The United States Department of Agriculture (USDA) Natural Resources Conservation Services (NRCS) has mapped and classified soils for more than 95 percent of the United States. Comments received during the initial scoping for this EIS included a "Custom Soils Resource Report for Island of Kaua'i, Hawai'i." The report was generated from the USDA NRCS website, which allows any internet user to define an area of interest, customize data results, and generate a Custom Soil Resource Report. The user can select or deselect parameters based upon which data the user would like to display. These user-generated reports are not evaluated by NRCS.

The NRCS soils classifications and descriptions provide a good information base, however, in-field soils testing is needed to identify existing soil nutrient levels and conditions. The most abundant soil types at the HDF site are Kalihi Clay at 32 percent, Ka'ena Clay Brown Variant at 29 percent, and Lualualei Clay at roughly 14 percent of the dairy site. Laboratory analysis of soil samples collected in 2014 identified levels of pH, phosphorus, nitrogen, potassium, calcium, magnesium, organic matter, salinity, micronutrients and other constituents. The results illustrate that the soils are depleted of nutrients, which is typical for lands formerly used for sugarcane. The soil nutrient status and fertility demands of the primary crop, Kikuyu grass, were used to identify the quantities of nutrients required for productive grass growth. The soils data provide a baseline to guide adaptive nutrient management throughout establishment and maturity of the dairy.

A second round of field sampling was conducted in 2015, and focused on evaluation of soils characterized as "poorly drained", and established a quantitative baseline of soil salinity and sodicity to provide for future monitoring of soil health with application of manure effluent. Laboratory analysis determined electrical conductivity and exchangeable sodium percentage, in addition to nutrient levels of nitrogen phosphorus calcium, magnesium, and potassium.

Poorly drained is not an indication of low or poor infiltration. Infiltration refers to the ability of water to enter the soil surface, whereas "drainage" refers to the movement of water within or from the soil profile. Poorly drained soils typically have low hydraulic conductivity, or a slow rate of groundwater movement through the soil. This slow movement can create anaerobic conditions, which typically result in higher rates of denitrification. This is the conversion of potentially nitrates and nitrites to gaseous forms, which reduces the potential for impacts on waterbodies. In this way, "poorly drained" soils may represent less risk of nitrate and nitrite leaching to associated waterbodies than "well drained" soils (Yost, 2016).

As a result of reduced movement of water through the soil profile, the mobility of nutrients such as potassium and phosphorus is also reduced. Soil types at the HDF site are known to adsorb and retain large amounts of phosphorus. Under the NRCS phosphorus leaching index for Hawai'i soils, HDF soils show low risk for leaching. With low risk, phosphorus can be applied at rates greater than crop requirements if manure or other organic materials are used to supply nutrients.

The dairy's focus on robust and healthy grass growth will build organic matter in soils through use of manure as a natural fertilizer. Soil can incorporate carbon from the atmosphere, which benefits soil health. According to recent studies in the Soil Science Society of America Journal, the conversion of formerly tilled cropland to grazed pasture can drive substantial accumulation of organic carbons in soil, with a potential to offset up to one-third of the annual increase in atmospheric carbon dioxide. The potential soil organic matter and carbon dioxide sequestration benefits are likely greatest in highly degraded soils in warm subtropical climates, partly due to long pasture-growing seasons. Long-term soil impacts are anticipated to result in improvement to the physical, chemical, and biological condition of the soil.

PESTS: A study of invertebrate species and pest insects was conducted by Steven Lee Montgomery, PhD, Consulting Biologist in January 2016. The study summarizes the presence or absence of native species or pest species associated with cattle manure in the general Māhā'ulepū area, as well as the parasites and predators that control those species. No federally or state listed endangered or threatened invertebrate species were noted in the survey of the site. A full report and list of species found on site is provided in EIS Section 4.11 and Appendix B.

Flies were identified on the HDF site using manure from neighboring livestock as bait for invertebrates. The two flies associated with livestock are the stable fly and the horn fly, the latter known for biting cattle. These flies and the greenbottle fly are often confused with the house fly. Flies known to exist on Kaua'i but not seen at the HDF site include the house fly, the dog dung fly, and the chicken dung fly. These pests are common in areas with high pet populations. It is possible these fly species could inadvertently be brought to the dairy and utilize manure as a food source. HDF will prevent and control fly population growth through diligent clean up and sanitation practices regarding any trash and food waste, as well as through efficient manure composting practices. A full list of site management measures is provided in EIS Section 4.11. The project location does not provide any habitat for *drosophila musaphilia*, the only Kaua'i species of native Hawaiian fly listed as Endangered or Threatened. Native Drosophila habitat is located many miles away in the high elevation koa-'ōhi'a forests.

Fly populations at HDF will be minimized through a process known as Integrated Pest Management (IPM). Essentially, IPM disrupts reproduction with appropriate means at key points in the pest's life cycle. Used in Hawai'i for decades, a number of invertebrates and a bird (the cattle egret) were introduced between 1898 and 1950 to reduce livestock-related insects. IPM utilizes knowledge of the ancient food web among species.

An especially important insect to minimize fly breeding habitat in manure is the dung beetle, which buries manure and incorporates it into the soil. Populations of dung beetles found on Kaua'i and those species already in Māhā'ulepū Valley, will increase with the increased manure food source, thus increasing and speeding breakdown of manure. Dung beetles are specialists in the very important natural process of breaking up and quickly recycling bovine manure pads. The behavioral diversity among dung beetle species will work together to bury dung pats in one to three days, a shorter amount of time than the 10-30 days flies eggs need to hatch.

In the Kōloa-Po'ipū region, pest fly populations are dependent upon food and breeding sources nearby such as dog, cat, and chicken feces. Beef cattle graze in the region on agricultural lands along Ala Kinoiki Road between Kōloa and Po'ipū, and it is likely the livestock-related flies identified at the HDF site occur in this region as well. Localized controls to reduce pest populations need to address breeding sites in and amongst the food and animals wastes within the area. These mitigation measures will make it difficult for flies to breed, and BMPs will be enforced to address any increase in population, therefore it is expected that the dairy farm will not significantly affect recreational and resort areas.

DEMOGRAPHIC AND ECONOMIC: The potential impacts of Hawai'i Dairy Farms (HDF) to the existing economy were evaluated in the Draft Environmental Impact Statement (EIS), including a fiscal impact assessment report completed in April, 2016 by Plasch Economics Pacific. Draft EIS Section 4.15 addresses demographic and economic factors, with the complete report in Appendix J.

The HDF project would create short-term benefits through jobs for local construction personnel and local material suppliers. Such jobs would include equipment operators, cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, supervisors, painters, etc. Based on State employment multipliers, indirect employment related to Dairy construction would be expected to average about 16 jobs on Kaua'i, and 8 on O'ahu. Construction employment would be expected to average about 12 jobs per year during the development period. Thus direct-plus-indirect employment association with construction would be expected to average approximately 36 jobs, of which 28 would be on Kaua'i.

The HDF project would contribute to diversification of Kaua'i's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Hawai'i Island), approximately10 percent of Hawai'i's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and indirect full-time equivalent jobs on Kaua'i, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on O'ahu.

HDF is expected to generate a net income of approximately $68,000 to the County when the 699 cow herd is established. When the dairy has matured to full

production for the 699 cow dairy, net income to the State is calculated at $160,000 annually. With the potential contemplated herd size of up to 2,000 mature dairy cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be produced. This would double local milk production currently supplied by operational dairies on the Island of Hawai'i.

Additional employment generated by a possible expansion to accommodate the contemplated 2,000 mature dairy cow herd is estimated at approximately 3 construction jobs plus 4 indirect jobs on Kaua'i, and 2 indirect jobs on O'ahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an additional 5 full-time farm jobs would be added, with approximately 15 additional indirect jobs on Kaua'i and another 8 indirect jobs on O'ahu.

The dairy is expected to generate a net additional contribution to the County of approximately $8,000 for improvements related to expansion for the contemplated herd size of up to 2,000 mature dairy cows ($76,000 total versus $68,000 for the committed herd size). The State will derive approximately $360,000 annually in revenues from the contemplated 2,000-mature dairy cow dairy.

Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhā'ulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick

alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhā'ulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Po'ipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhā'ulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawai'i Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhā'ulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhā'ulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhā'ulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kaua'i community.

Regional Water Demand: The adjacent, developed Kōloa-Po'ipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kaua'i will increase county-wide by 17,300 residents by 2030. The South Kaua'i population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kaua'i region (the Kōloa - Po'ipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhā'ulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhā'ulepū watershed.

The HDF site is located on the bottom-land of the upper Māhā'ulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Ha'upu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhā'ulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kaua'i Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhā'ulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhā'ulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhā'ulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain

the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Poʻipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean

water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kauaʻi community.

AIR QUALITY: As a part of the Environmental Impact Statement (EIS), existing air quality conditions and project impacts were evaluated, including dust and odor. Potential odors and emission levels for air pollutants relevant to dairy operations were modeled, as currently there are no cows on site. EIS sections 4.19 and 4.25 provide an evaluation of air quality and odors, including a windrose depicting wind speed and direction in the area (see DEIS Section 4.1, Climate). The full air quality technical report can be found in Draft EIS Appendix I.

Clean Air Act

Under the *Clean Air Act of 1970* (CAA), amended November 1990, the U.S. Environmental Protection Agency (EPA) regulates both large and small sources of air pollutants by establishing National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. The State of Hawaiʻi has established its own *State Ambient Air Quality Standards* (SAAQS) that are as strict or, in some cases more strict than the NAAQS. State standards prohibit any visible emissions of fugitive dust from construction activities at the property line.

Emissions relevant to livestock operation include particulate matter and fugitive dust. Greenhouse gases related to dairy cows include methane (CH_4) from enteric fermentation, and both methane and nitrous oxide (N_20) emissions from manure application. No State or Federal regulations for greenhouse gas emissions from farm operations or small businesses currently exist.

DUST

Dust will be generated as cows move along soft limestone walkways that connect the paddocks and lead to and from the milking parlor. Potential fugitive dust emission rates were estimated from published literature, where particulate matter (PM) is measurable from the "drylots" of confined dairy operations where animals walk over dirt and dried manure throughout the day.

Applying the emission rates from this available literature greatly overestimates potential emission resulting from HDF. Cows in the pastoral rotational-grazing

system will be on pasture 22 hours each day and will spend two hours – in two separate milking cycles –moving to and from the barn for the 10- to 15-minute milking sessions.

Using atmospheric dispersion modeling system (AERMOD), the rates were scaled to the size of the non-pasture areas used by cows at HDF. Results were added to the background concentration of particulate matter (both PM_{10} and $PM_{2.5}$) measured on the island of Kaua'i, and the total concentration was compared to the State ambient air quality standards. Only the contemplated herd size of up to 2,000 mature dairy cows was modeled, as at the lower threshold of 699 cows, the potential fugitive dust impact would be negligible. The estimated concentration for PM_{10} is 2.01 $\mu g/m^3$, well below the State standard of 150 $\mu g/m^3$. The estimated concentration for $PM_{2.5}$ is 0.23 $\mu g/m^3$, well below the Federal standard of 35 $\mu g/m^3$ (see Draft EIS Section 4.19 and Table 4-19.2).

ODOR

Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF, so air dispersion models were used to determine potential odor levels. Local weather data was used in conjunction with the AERMOD modeling system, and published rates for manure odors emissions for dairy heifers and effluent ponds were adapted to reflect the HDF facilities.

Odor emission sources identified for modeling at HDF were manure in the pasture fields, irrigation water containing diluted nutrients from effluent, the effluent storage ponds, and the dairy buildings. Odor rates from published research were applied. Odor isopleths (a line used to map all points having the same numerical value) were created to display the model findings. Odor is described in "odor units" at the threshold of perception, which is defined by the point at which 50 percent of panelists, in laboratory conditions, cannot smell the odor but 50 percent of the panelists can detect the odor.

Modeling results were generated for worst case meteorological conditions (low wind velocity / mixing). Generally, tradewinds will disperse odors to less than detectable levels beyond the HDF site; in periods of no wind, odor may not be dispersed creating the "worst case" scenario. In these periods without normal tradewind flow, the odor plume would extend to the south of the HDF site. Sections 4.19.2 and 4.25.2 of the EIS include graphics of the potential odor isopleths.

Results for the committed herd size of 699 mature dairy cows show that odors may be detectable by 50 percent of the sensitive population once per 200 hours, or 44 hours per year, within an area that extends approximately 1,670-feet (within one-third of a mile) beyond the dairy farm boundary, and does not reach recreational or residential areas. Results for the contemplated expanded herd size of up to 2,000 mature dairy cows show odors would not extend beyond 2,780 feet outside the HDF boundary (just over half a mile), again not reaching recreational or residential areas, and again with detection limited to 50 percent of the sensitive population approximately 44 hours per year. The parameters used in the analysis were

intentionally conservative, and the impacts shown assume an unlikely confluence of worst-case meteorological data, irrigation location, and grazing location. Actual offsite odor impacts are likely to be much lower and/or less frequent than shown; it is likely odor detection beyond the HDF boundaries will be less frequent.

ALTERNATIVES: As a part of the DEIS, alternatives were evaluated that could attain the objectives of the action's purpose and need, and were compared with environmental benefits, costs, and risks of each reasonable alternative against those of the proposed dairy project. Further discussion of alternatives can be found in DEIS Section 6.

The DEIS evaluates alternatives that could attain the objectives of the action's purpose and need, and compares environmental benefits, costs, and risks of each reasonable alternative against those of the proposed action. Additionally, reasonable land use alternatives that emerged from public input during the project scoping phase are documented and briefly discussed. The alternatives that do not meet the project purpose are not advanced for analysis of environmental benefits, costs, and risks. The Environmental Impact Statement Rules, Hawai'i Administrative Rules Chapter 11-200 (HRS 11-200) requires a discussion of alternatives that could attain the objectives of the action, regardless of cost. There is no requirement for the alternatives analysis to consider every possible land use.

Four possible land uses that would not meet the project purpose are discussed. Rezoning the land for resort or residential development, or a potential conservation condemnation are two uses that were examined and eliminated from analysis. These options would not be reasonably viable given the existing private land tenure and existing zoning. Two additional alternatives were considered as reasonable land uses as they could be permitted within the existing State Land Use Agricultural District and County Agricultural Zoning District. These options include Agricultural Park with Processing Center, and development of an Agricultural Subdivision. The alternatives were examined and eliminated from further analysis, however, as they would not fulfill the project purpose.

The analysis, therefore, focuses on alternatives that meet the project purpose. Rigorous exploration and evaluation of the environmental impacts of the alternatives, including those that might enhance environmental quality or avoid, reduce or minimize some or all of the adverse environmental effects, costs and risks. These alternatives include: (1) the development of a Conventional Feedlot Dairy (a non-pasture-based dairy) at the same location; (2) development of the Pasture-Based Dairy at an Alternative Location on Kaua'i; and (3) milk products processing by HDF. The alternative of "No Action" is also evaluated.

The alternatives analysis provides a comprehensive evaluation of the range of potential alternatives, including the two alternative development scenarios. Although the alternatives are potentially reasonable uses under existing zoning and neighboring uses, each fails to comprehensively fulfill the project requirements defined by the eight Project Objectives and the four established Evaluation Criteria (Chapter 2, Sections 2.3.3 and 2.3.4).

The essential differences as compared to the proposed action are highlighted in the following statements.

- Only one of the alternative actions (conventional feedlot alternative) would create a commercial scale dairy operation in Hawai'i, with the capability to produce 10 percent of the State's fresh milk demand thus reducing dependence on imported milk (Objective 1). This alternative, however, would not reduce reliance on costly imported fertilizer and feed (Objective 2); grow local, quality grass as a primary feedstock (Objective 3); and would not utilize 100 percent of manure on site as nutrients to grow forage for dairy cows (Criterion 4).
- None of the alternatives would secure a dairy location that meets the requirements for a pastoral, pasture-based grazing dairy: sufficient contiguous land area; available long-term land tenure; adequate potable water supply; suitable soil properties; gentle slope conditions; and accessibility (Criterion 1).
- One alternative (Agricultural Park) could potentially generate new long-term employment in the agricultural sector on Kaua'i in a wide range of positions including pasture agronomy/soils science, environmental resources management (Criterion 2).
- The Agricultural Park alternative could also develop sustainable food production utilizing Important Agricultural Lands, demonstrating the importance of long-term agricultural leases and capital investment for agricultural infrastructure, water systems and support facilities. (Criterion 3). However, after years of trying, it appears there was limited interest in such a venture.
- Finally, addressing the range of potential environmental impacts (natural, cultural, social and economic) (Objective 8) the two alternative development scenarios would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.

In contrast to the other options considered, the planned agricultural operation of Hawai'i Dairy Farms, was determined to be the most viable option and is the preferred alternative. Of all the alternatives considered, this is the only approach that achieves project objectives and meets each of the four Evaluation Criteria.

- Hawai'i Dairy Farms will create a commercial scale pasture-based dairy operation in Hawai'i, with the capability to provide more than 1,000,000 gallons of the fresh milk demand, reducing dependence on imported milk (Objective 1).
- The planned dairy location meets the requirements of minimum land area, soil properties, slope conditions, water supply, land tenure and availability, and accessibility (Criterion 1).
- The planned action will generate new long-term employment in the agricultural sector on Kaua'i, including pasture agronomy/soils science, veterinary and animal husbandry, environmental resources management, milk/milk processing, and dairy business management (Criterion 2).

- Sustainable food production utilizing Important Agricultural Lands (Criterion 3) will occur with the proposed action, demonstrating the importance of long term agricultural leases, and the ability to draw capital investment for agricultural infrastructure including water systems and support facilities (Criterion 3).
- Address the range of potential environmental impacts by utilizing 100 percent of manure as natural fertilizer to grow the majority of food for cows (Criterion 4). The alternatives evaluated would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.
- Creating an economically viable pasture rotational-grazing model maintains agriculture, retains open space, and provides buffer between highly utilized resort and residential development and sensitive natural or cultural resources (Objective 8).

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

Phillip L. and Kathleen L. Blessing
2370 Ho'ohu Road
Koloa, HI 96756

February ~~11~~ 23, 2015

VIA CERTIFIED MAIL, RETURN RECEIPT

State of Hawai'i
Department of Health
1250 Punchbowl Street
Honolulu, HI 96813

VIA CERTIFIED MAIL, RETURN RECEIPT

Group 70 International, Inc.
925 Bethel Street
5th Floor
Honolulu, HI 96813

VIA CERTIFIED MAIL, RETURN RECEIPT

Hawai'I Dairy Farms, LLC
P.O. Box 1690
Koloa, HI 96756-1690

RE: RESPONSE TO PROPOSED ENVIRONMENTAL IMPACT STUDY

To all whom it may concern,

We reside at 2370 Ho'ohu Road in the Makanui Condominium complex. Our home is located very close to the southern most point on Kauai at Poipu. The proposed Dairy Farm will negatively impact our property value, and ability to enjoy the outdoors. Additionally, it will contaminate the air with stench from the cows waste and manure.

First, due to our close proximity to the Dairy Farm we will necessarily be impacted by the biting flies, which will originate from the proposed number of cows on the acreage. This is an issue, which is not addressed, in the proposed EIS. However, this will occur and it will eliminate our ability to sit outside during the day and evenings without being bitten. It will also eliminate my ability to enjoy playing tennis and golf outside five days each week in the Poipu area.

The odor and stench from 2,000 cows which will generate 200,000 pounds of manure and 16,000 gallons of urine on clay soil each day will further decrease our enjoyment of our property. The impact of the odor is also not addressed by the proposed EIS but will occur, will impact our enjoyment of our condominium and will also negatively impact property values. We often sit inside with the screen door open to enjoy the weather. We will not be able to do this with biting flies, stench and odor. Moreover, our condominium does not have air-conditioning so holing up inside is not an option for us.

Further, the foregoing will depreciate our property value and along with it the tax base. Potential purchasers of the property and tourist will look elsewhere as no one comes to Kauai to avoid being bitten by flies and smell foul odors.

These same factors will also directly and negatively impact the tourist industry on the South Side of Kauai. A prime example of this is the loss of conventions already experienced by the Grand Hyatt.

On a broader scale, the proximity of the Koloa drinking wells to the Dairy Farm and the strong probability of contamination to that drinking water if the Dairy Farm proceeds with its plans places the health of the entire community at risk. I recognize that the Dairy Farm does not want to acknowledge that in Kauai we do have days and nights of heavy rain fall because it does not fit within the parameters of their proposed plan, but all of us who live here know that this occurs. When it does, the drinking water of the residents will be contaminated.

Independent experts have already determined that the Maha'ulepu soil is primarily non-absorbent clay and that the manure and urine from the cows will naturally flow into the watersheds and the ocean, but again the proposed EIS declines to consider these facts from independent scientists.

The Hawai'i Dairy Farm's Position that its presence will not negatively affect the community is not well considered. Employees of the Hyatt who have lost their jobs would "beg to differ." Due to the cancellation of conventions at the Grand Hyatt, when word of the proposed Dairy Farm became news, employees lost their jobs. The Hawai'i Dairy Farm is already adversely impacting our community.

Finally, there are many alternate locations where this project could occur which would not have the direct and negative impact that it will have with its proposed current placement at Maha'ulepu. It is baffling that the Hawai'I Dairy Farm continues to strong-arm a community when the scientific evidence of its negative impact on the community is so grossly overwhelming.

Your consideration of the foregoing is critical to a long established way of life on Kauai.

Sincerely,

Phillip L Blessing

Phillip L. . Blessing

Kathleen L Blessing

Kathleen L. Blessing

May 26, 2016

Phillip L. and Kathleen L. Blessing
2370 Ho'ohu Road
Koloa, HI 96756

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Phillip L. and Kathleen L. Blessing:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

SOILS: Soil is an ecosystem that can be managed to provide nutrients for plant growth, to absorb and hold rainwater for use during dryer periods, to filter and buffer potential pollutants from leaving fields, to serve as a firm foundation for agricultural activities, and to provide habitat for soil microbes to flourish and diversify to keep the ecosystem healthy. Two rounds of independent soil sampling were undertaken at HDF to understand and characterize available soil nutrients and conditions. Section 4.3 of the Environmental Impact Statement (EIS) characterizes soil conditions, and anticipated impacts from effluent and supplemental nutrient application. Recommendations from Dr. Russell Yost and Nicholas Krueger of the University of Hawai'i at Mānoa are summarized. Their baseline nutrient report is included as Appendix C of the Draft EIS.

Soil conservation is a core principal behind establishment of the NRCS, which was formed out of the Soil Conservation Service to acknowledge its expanded role in watershed-scale approach using science-based tools and standards in agronomy, engineering economics, wildlife biology and other disciplines to aid landowners in implementation of conservation practices. NRCS conservation practices are listed in Chapter 3, Section 3.2; these practices codes identify design and construction standards related to drainage, materials, operations and applicable engineering standards. HDF will follow the developed Conservation Plan, which was approved by the West Kaua'i Soil & Water Conservation District in December, 2013.

The United States Department of Agriculture (USDA) Natural Resources Conservation Services (NRCS) has mapped and classified soils for more than 95 percent of the United States. Comments received during the initial scoping for this EIS included a "Custom Soils Resource Report for Island of Kaua'i, Hawai'i." The report was generated from the USDA NRCS website, which allows any internet user to define an area of interest, customize data results, and generate a Custom Soil Resource Report. The user can select or deselect parameters based upon which data the user would like to display. These user-generated reports are not evaluated by NRCS.

The NRCS soils classifications and descriptions provide a good information base, however, in-field soils testing is needed to identify existing soil nutrient levels and conditions. The most abundant soil types at the HDF site are Kalihi Clay at 32 percent, Ka'ena Clay Brown Variant at 29 percent, and Lualualei Clay at roughly 14 percent of the dairy site. Laboratory analysis of soil samples collected in 2014 identified levels of pH, phosphorus, nitrogen, potassium, calcium, magnesium, organic matter, salinity, micronutrients and other constituents. The results illustrate that the soils are depleted of nutrients, which is typical for lands formerly used for sugarcane. The soil nutrient status and fertility demands of the primary crop, Kikuyu grass, were used to identify the quantities of nutrients required for productive grass growth. The soils data provide a baseline to guide adaptive nutrient management throughout establishment and maturity of the dairy.

A second round of field sampling was conducted in 2015, and focused on evaluation of soils characterized as "poorly drained", and established a quantitative baseline of soil salinity and sodicity to provide for future monitoring of soil health with application of manure effluent. Laboratory analysis determined electrical conductivity and exchangeable sodium percentage, in addition to nutrient levels of nitrogen phosphorus calcium, magnesium, and potassium.

Poorly drained is not an indication of low or poor infiltration. Infiltration refers to the ability of water to enter the soil surface, whereas "drainage" refers to the movement of water within or from the soil profile. Poorly drained soils typically have low hydraulic conductivity, or a slow rate of groundwater movement through the soil. This slow movement can create anaerobic conditions, which typically result in higher rates of denitrification. This is the conversion of potentially nitrates and nitrites to gaseous forms, which reduces the potential for impacts on waterbodies. In this way, "poorly drained" soils may represent less risk of nitrate and nitrite leaching to associated waterbodies than "well drained" soils (Yost, 2016).

As a result of reduced movement of water through the soil profile, the mobility of nutrients such as potassium and phosphorus is also reduced. Soil types at the HDF site are known to adsorb and retain large amounts of phosphorus. Under the NRCS phosphorus leaching index for Hawai'i soils, HDF soils show low risk for leaching. With low risk, phosphorus can be applied at rates greater than crop requirements if manure or other organic materials are used to supply nutrients.

The dairy's focus on robust and healthy grass growth will build organic matter in soils through use of manure as a natural fertilizer. Soil can incorporate carbon from the atmosphere, which benefits soil health. According to recent studies in the Soil Science Society of America Journal, the conversion of formerly tilled cropland to grazed pasture can drive substantial accumulation of organic carbons in soil, with a potential to offset up to one-third of the annual increase in atmospheric carbon dioxide. The potential soil organic matter and carbon dioxide sequestration benefits are likely greatest in highly degraded soils in warm subtropical climates, partly due to long pasture-growing seasons. Long-term soil impacts are anticipated to result in improvement to the physical, chemical, and biological condition of the soil.

PESTS: A study of invertebrate species and pest insects was conducted by Steven Lee Montgomery, PhD, Consulting Biologist in January 2016. The study summarizes the presence or absence of native species or pest species associated with cattle manure in the general Māhā'ulepū area, as well as the parasites and predators that control those species. No federally or state listed endangered or threatened invertebrate species were noted in the survey of the site. A full report and list of species found on site is provided in EIS Section 4.11 and Appendix B.

Flies were identified on the HDF site using manure from neighboring livestock as bait for invertebrates. The two flies associated with livestock are the stable fly and the horn fly, the latter known for biting cattle. These flies and the greenbottle fly are often confused with the house fly. Flies known to exist on Kaua'i but not seen at the HDF site include the house fly, the dog dung fly, and the chicken dung fly. These pests are common in areas with high pet populations. It is possible these fly species could inadvertently be brought to the dairy and utilize manure as a food source. HDF will prevent and control fly population growth through diligent clean up and sanitation practices regarding any trash and food waste, as well as through efficient manure composting practices. A full list of site management measures is provided in EIS Section 4.11. The project location does not provide any habitat for *drosophila musaphilia*, the only Kaua'i species of native Hawaiian fly listed as Endangered or Threatened. Native Drosophila habitat is located many miles away in the high elevation koa-'ōhi'a forests.

Fly populations at HDF will be minimized through a process known as Integrated Pest Management (IPM). Essentially, IPM disrupts reproduction with appropriate means at key points in the pest's life cycle. Used in Hawai'i for decades, a number of invertebrates and a bird (the cattle egret) were introduced between 1898 and 1950 to reduce livestock-related insects. IPM utilizes knowledge of the ancient food web among species.

An especially important insect to minimize fly breeding habitat in manure is the dung beetle, which buries manure and incorporates it into the soil. Populations of dung beetles found on Kaua'i and those species already in Māhā'ulepū Valley, will increase with the increased manure food source, thus increasing and speeding breakdown of manure. Dung beetles are specialists in the very important natural process of breaking up and quickly recycling bovine manure pads. The behavioral diversity among dung beetle species will work together to bury dung pats in one to three days, a shorter amount of time than the 10-30 days flies eggs need to hatch.

In the Kōloa-Po'ipū region, pest fly populations are dependent upon food and breeding sources nearby such as dog, cat, and chicken feces. Beef cattle graze in the region on agricultural lands along Ala Kinoiki Road between Kōloa and Po'ipū, and it is likely the livestock-related flies identified at the HDF site occur in this region as well. Localized controls to reduce pest populations need to address breeding sites in and amongst the food and animals wastes within the area. These mitigation measures will make it difficult for flies to breed, and BMPs will be enforced to address any increase in population, therefore it is expected that the dairy farm will not significantly affect recreational and resort areas.

DEMOGRAPHIC AND ECONOMIC: The potential impacts of Hawai'i Dairy Farms (HDF) to the existing economy were evaluated in the Draft Environmental Impact Statement (EIS), including a fiscal impact assessment report completed in April, 2016 by Plasch Economics Pacific. Draft EIS Section 4.15 addresses demographic and economic factors, with the complete report in Appendix J.

The HDF project would create short-term benefits through jobs for local construction personnel and local material suppliers. Such jobs would include equipment operators, cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, supervisors, painters, etc. Based on State employment multipliers, indirect employment related to Dairy construction would be expected to average about 16 jobs on Kaua'i, and 8 on O'ahu. Construction employment would be expected to average about 12 jobs per year during the development period. Thus direct-plus-indirect employment association with construction would be expected to average approximately 36 jobs, of which 28 would be on Kaua'i.

The HDF project would contribute to diversification of Kaua'i's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Hawai'i Island), approximately10 percent of Hawai'i's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and indirect full-time equivalent jobs on Kaua'i, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on O'ahu.

HDF is expected to generate a net income of approximately $68,000 to the County when the 699 cow herd is established. When the dairy has matured to full

production for the 699 cow dairy, net income to the State is calculated at $160,000 annually. With the potential contemplated herd size of up to 2,000 mature dairy cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be produced. This would double local milk production currently supplied by operational dairies on the Island of Hawai'i.

Additional employment generated by a possible expansion to accommodate the contemplated 2,000 mature dairy cow herd is estimated at approximately 3 construction jobs plus 4 indirect jobs on Kaua'i, and 2 indirect jobs on O'ahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an additional 5 full-time farm jobs would be added, with approximately 15 additional indirect jobs on Kaua'i and another 8 indirect jobs on O'ahu.

The dairy is expected to generate a net additional contribution to the County of approximately $8,000 for improvements related to expansion for the contemplated herd size of up to 2,000 mature dairy cows ($76,000 total versus $68,000 for the committed herd size). The State will derive approximately $360,000 annually in revenues from the contemplated 2,000-mature dairy cow dairy.

Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhā'ulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick

alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhā'ulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Po'ipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhā'ulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawai'i Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhā'ulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhā'ulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhā'ulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kaua'i community.

Regional Water Demand: The adjacent, developed Kōloa-Po'ipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kaua'i will increase county-wide by 17,300 residents by 2030. The South Kaua'i population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kaua'i region (the Kōloa - Po'ipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhā'ulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhā'ulepū watershed.

The HDF site is located on the bottom-land of the upper Māhā'ulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Ha'upu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhā'ulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kaua'i Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhā'ulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhā'ulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhā'ulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain

the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Poʻipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean

water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kauaʻi community.

AIR QUALITY: As a part of the Environmental Impact Statement (EIS), existing air quality conditions and project impacts were evaluated, including dust and odor. Potential odors and emission levels for air pollutants relevant to dairy operations were modeled, as currently there are no cows on site. EIS sections 4.19 and 4.25 provide an evaluation of air quality and odors, including a windrose depicting wind speed and direction in the area (see DEIS Section 4.1, Climate). The full air quality technical report can be found in Draft EIS Appendix I.

Clean Air Act

Under the *Clean Air Act of 1970* (CAA), amended November 1990, the U.S. Environmental Protection Agency (EPA) regulates both large and small sources of air pollutants by establishing National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. The State of Hawaiʻi has established its own *State Ambient Air Quality Standards* (SAAQS) that are as strict or, in some cases more strict than the NAAQS. State standards prohibit any visible emissions of fugitive dust from construction activities at the property line.

Emissions relevant to livestock operation include particulate matter and fugitive dust. Greenhouse gases related to dairy cows include methane (CH_4) from enteric fermentation, and both methane and nitrous oxide (N_20) emissions from manure application. No State or Federal regulations for greenhouse gas emissions from farm operations or small businesses currently exist.

DUST

Dust will be generated as cows move along soft limestone walkways that connect the paddocks and lead to and from the milking parlor. Potential fugitive dust emission rates were estimated from published literature, where particulate matter (PM) is measurable from the "drylots" of confined dairy operations where animals walk over dirt and dried manure throughout the day.

Applying the emission rates from this available literature greatly overestimates potential emission resulting from HDF. Cows in the pastoral rotational-grazing

system will be on pasture 22 hours each day and will spend two hours – in two separate milking cycles –moving to and from the barn for the 10- to 15-minute milking sessions.

Using atmospheric dispersion modeling system (AERMOD), the rates were scaled to the size of the non-pasture areas used by cows at HDF. Results were added to the background concentration of particulate matter (both PM_{10} and $PM_{2.5}$) measured on the island of Kaua'i, and the total concentration was compared to the State ambient air quality standards. Only the contemplated herd size of up to 2,000 mature dairy cows was modeled, as at the lower threshold of 699 cows, the potential fugitive dust impact would be negligible. The estimated concentration for PM_{10} is 2.01 $\mu g/m^3$, well below the State standard of 150 $\mu g/m^3$. The estimated concentration for $PM_{2.5}$ is 0.23 $\mu g/m^3$, well below the Federal standard of 35 $\mu g/m^3$ (see Draft EIS Section 4.19 and Table 4-19.2).

ODOR

Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF, so air dispersion models were used to determine potential odor levels. Local weather data was used in conjunction with the AERMOD modeling system, and published rates for manure odors emissions for dairy heifers and effluent ponds were adapted to reflect the HDF facilities.

Odor emission sources identified for modeling at HDF were manure in the pasture fields, irrigation water containing diluted nutrients from effluent, the effluent storage ponds, and the dairy buildings. Odor rates from published research were applied. Odor isopleths (a line used to map all points having the same numerical value) were created to display the model findings. Odor is described in "odor units" at the threshold of perception, which is defined by the point at which 50 percent of panelists, in laboratory conditions, cannot smell the odor but 50 percent of the panelists can detect the odor.

Modeling results were generated for worst case meteorological conditions (low wind velocity / mixing). Generally, tradewinds will disperse odors to less than detectable levels beyond the HDF site; in periods of no wind, odor may not be dispersed creating the "worst case" scenario. In these periods without normal tradewind flow, the odor plume would extend to the south of the HDF site. Sections 4.19.2 and 4.25.2 of the EIS include graphics of the potential odor isopleths.

Results for the committed herd size of 699 mature dairy cows show that odors may be detectable by 50 percent of the sensitive population once per 200 hours, or 44 hours per year, within an area that extends approximately 1,670-feet (within one-third of a mile) beyond the dairy farm boundary, and does not reach recreational or residential areas. Results for the contemplated expanded herd size of up to 2,000 mature dairy cows show odors would not extend beyond 2,780 feet outside the HDF boundary (just over half a mile), again not reaching recreational or residential areas, and again with detection limited to 50 percent of the sensitive population approximately 44 hours per year. The parameters used in the analysis were

intentionally conservative, and the impacts shown assume an unlikely confluence of worst-case meteorological data, irrigation location, and grazing location. Actual offsite odor impacts are likely to be much lower and/or less frequent than shown; it is likely odor detection beyond the HDF boundaries will be less frequent.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

Hawai'i Dairy Farms

MAHA'ULEPU, KAUA'I

ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE

An Environmental Impact Statement (EIS) is being prepared voluntarily by the Applicant to assess potential environmental impacts and mitigation measures associated with agricultural operations at Hawai'i Dairy Farms (HDF) at Māhā'ulepū, Kaua'i.

To assist in preparing the EIS, an Environmental Impact Statement Preparation Notice (EISPN) was recently published. A 30-day public comment period on the EISPN ends February 23, 2015. The purposes of the publication and comment period are two-fold:

1. to allow individuals and groups to request to become a consulted party; and
2. to provide written comment regarding effects of the proposed action.

NOTE: Submitted comments will be published in the Draft EIS

COMMENT

Name: Sharon Boll Organization: _____

Preferred contact Method

Email: _____ Postal Address: P.O. Box 1576 Kapaa Hi 96746

Phone: (Optional) _____

Comments: Aloha

Be clear that most people on Kauai do not want a dairy in our beautiful Koloa, Poipu, Maha'ulepu area. It is a delicate + beautiful area, undeveloped and culturally significant. We know without an environmental impact statement that cow "discharge" + stampede will eventually currupt the ecosystem. There is NO SUCH THING AS A "ZERO DISCHARGE" COW! We are concerned that once the dairy is underway the land will be further developed because that is where the real money is. Additionally, my understanding is that the dairy product is not even intended for Kauai. The law of the land is Malama 'Aina and a dairy like this does not belong that close to the ocean, people and cultural sites. Please find a more responsible place.

Mahalo

Sharon Boll

Return to:

Group 70 International, Inc.
925 Bethel Street, 5th Floor
Attn: HDF Project
Honolulu, HI 96813
hdf@group70int.com

And/or:

Hawaii State Department of Health
Environmental Planning Office
919 Ala Moana Boulevard, Rm. 312
Honolulu, HI 96814
epo@doh.hawaii.gov

Deadline: February 23, 2015

GROUP 70 INTERNATIONAL

May 26, 2016

Sharon Boll
P.O. Box 1576
Kapaa, HI 96746

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Sharon Boll:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

DAIRY OPERATIONS: Hawai'i Dairy Farms (HDF) will establish and operate a sustainable, pastoral rotational-grazing dairy farm in Māhā'ulepū Valley on the island of Kaua'i to produce fresh, locally available nutritious milk for Hawai'i families. The rotational-grazing method utilizes 100 percent of the cows' manure as natural fertilizer to grow pasture grass as a primary source of nutrition for dairy cows. This cost-effective method will reduce reliance on imported fertilizer and feed. Pasture grass will comprise at least 70 percent of the animals' diet. As a part of the Draft Environmental Impact Statement (EIS), the proposed facilities and operations for the dairy farm are described in Chapter 3.

The Environmental Impact Statement (EIS) Preparation Notice (EISPN), published January 23, 2015, described the proposed pasture-based rotational grazing system as a "zero-discharge, grass-fed dairy". The term "zero-discharge" under the U.S.

Environmental Protection Agency related to concentrated feeding operations (CAFO) is a system designed to not discharge pollutants into waters of the United States. As noted previously, the HDF system is designed to utilize 100 percent of the cows' manure on-site. However, nutrients would be introduced to the HDF site with any use; the Draft EIS identifies the amount of nutrients anticipated from the proposed dairy operations that could pass through to ground and surface waters. Therefore, HDF elected to discontinue use of the term "zero discharge" as it was construed as no nutrients into the system.

The term "grass-fed" was used in the HDF EISPN. This term was used to identify HDF's intent to utilize a locally-produced feedstock – grass – for more than 70 percent of the dairy herds' diet. In January 2016, the U.S. Department of Agricultural (USDA) Marketing Survey created a narrow legal definition of "grass-fed". The USDA standard defines what animals can and cannot be fed. The Food Alliance, a project of several northwest colleges, believes that when consumers choose grass-fed products there is an expectation that these will come from animals raised on pasture on a forage-based diet. Due to the evolving definition of "grass-fed", the term in not used in this EIS.

The dairy facilities will occupy an area of approximately 10 acres on the western boundary of the site. The developed area "footprint" will be less than 2 percent of the total farm area. Four buildings will be constructed to serve different functions, supported by utilities and infrastructure. Additional building information can be found in Draft EIS Section 3.3.1.

Agricultural infrastructure and utilities required for the dairy operations will include storage tanks and silos, effluent storage ponds, livestock water systems, and drainage improvements. The irrigation system and distribution of livestock water are discussed in Draft EIS Section 3.5, Pasture Management.

The pastoral rotational-grazing dairy provides a local feedstock – grass – as the herd's primary food source. Reducing imported feed stabilizes costs and provides a food source closer to the natural diet of cows. Results of grass trials initially conducted at five sites across four Hawaiian Islands were instrumental in identifying appropriate varieties of grass, and suitable sites to support sufficient "dry matter" grass yields essential to a cow's diet. Additional project-specific trials at the Māhāʻulepū site on Kauai have been conducted for more than 18 months. The results have identified sufficient yield and nutrition to supply 70 percent of the cows' diet; improvements in grass productivity are anticipated to provide up to 85 percent of cows' diet.

The pasture-based model allows cows to move about freely, and to lie down and rest, which is part of the digestion cycle. The animals are managed in social groups known as "mobs", mimicking the natural social order of bovines. Cows spend 22 hours of each 24-hour period foraging on pasture or resting, outdoors in natural light and fresh air. The gently sloped paddocks, walkways and races minimize the energy expended by the mature dairy cows as they graze or are transferred to and from the various paddocks and the mature dairy facility; surfaces of the walkways and cow races are designed to provide a comfortable path under hoof. The

management practices and pasture model applied by HDF maximizes grass as the cows' primary nutrition source and minimizes stress to the animals. Cows tend to be healthier and live longer, productive lives with access to fresh air, high quality feed, and exercise while they forage.

The 470 acres of pasture will be divided into paddocks averaging 3 to 5 acres in size. Smaller paddocks located near the dairy facility will be used as temporary pasture for cows or calves being moved on or off the farm. To protect the water quality of surface water and downstream areas, paddock fences are set back 35 feet from the edge of drainage ways throughout the site. Existing vegetation within the setbacks will be managed or restored to reduce erosion, improve stability of ditch banks, increase net carbon storage, and improve and maintain water quality.

The majority of the pastures will be irrigated with non-potable water and/or diluted effluent through either the pivot irrigation systems or through gun irrigators. Irrigation water supply is provided to the farm from Waita Reservoir, and will be filtered and pumped to the various irrigation components on the farm. The irrigation system is controlled using computer software and GPS receivers to allow very precise application of irrigation and/or diluted effluent on the pasture. The pivots can rotate and apply irrigation water and/or diluted effluent at different rates depending on the actual irrigation needs of the farm.

NRCS provides technical guidance on applying agricultural waste depending on the desired use of the waste. Reflected in the title of the livestock waste guidance for Hawaiʻi is the parenthetical inclusion of the word "nutrients." Where waste is utilized as a resource, it is being used for the constituent components that provide benefit.

The NRCS Conservation Practice Standard 590, Nutrient Management, applies to commercial fertilizers, organic by-products, waste water, organic matter, and irrigation water. Nutrient management is the practice of managing the amount, rate, source, method of application, and timing of plant nutrients and soil amendments. The timing and application of nutrients will correspond with plant uptake, soil properties and weather conditions. For more information on nutrient balance management see Draft EIS Section 3.5.3, and Draft EIS Appendix D.

The effluent storage ponds are sized to accommodate 30 days of storage for up to 2,000 mature dairy cows, and over 85 days of storage for 699 mature dairy cows. It will be highly unlikely that the storage pond will be full at any time for the contemplated 2,000-cow dairy, and nearly impossible for the committed 699-cow dairy. Throughout the less than 30-day storage period, effluent is planned for application every four days, and the slurry application is expected at least once every 45 days, to ensure that the ponds are kept at manageable levels.

Cows lactate milk following the birth of calves. Newborn calves will be housed on the Māhāʻulepū site and provided essential colostrum and nutrients for a healthy start. During the calves' initial 90 days, they will be transitioned to pasture at HDF before transfer to ranches on Kauaʻi to be raised off-site. The committed herd size of 699 mature dairy cows at the Māhāʻulepū site applies to mature mature dairy cows.

Animals in various stages of lactation and rest will be transferred between HDF and other partner ranches as needed for animal health and dairy productivity. This will benefit both the dairy and infuse the beef market in Hawai'i with a new, local source of pasture-raised calves. Male calves will become part of the beef cattle herd; heifers (young female calves that haven't given birth) will be raised until ready to return to the HDF herd as a birthing/mature dairy cow. For more information on off-site herd management, refer to Section 3.7 of the Draft EIS.

Health of the herd is of primary importance as the success of a dairy relies on cows effectively producing quality milk. All cows will be treated with a high standard of care. Dairy managers and caretakers will be trained and competent in handling animals to minimize stress and ensure the herds' welfare. A licensed veterinarian may prescribe use of antibiotics approved by the Food & Drug Administration (FDA) for treatment of illnesses. Adherence to guidelines that prohibit milk from cows undergoing antibiotic treatment will ensure no adulteration of milk. Routine laboratory tests of milk for traces of antibiotic residue will be conducted. HDF will not inject cows with bovine growth hormone, referred to as rBST or rBGH.

VISUAL RESOURCES: The Draft Environmental Impact Statement (EIS) addresses the existing visual and aesthetic resources of the dairy site, and the potential impacts of Hawai'i Dairy Farms. Draft EIS Section 4.5 addresses potential effects to public scenic views.

The County of Kaua'i General Plan identifies the HDF site as agricultural land in a region consisting of open space, parks, and conservation lands in the mountains and along the coast. The important visual landforms identified in the surrounding region are Pu'u Hunihuni Crater to the southwest, the scenic roadway corridor of Ala Kinoiki Road, and the Hā'upu Mountains that surround the project area to the northeast. However, the majority of the project area has gentle topography, with no evident physical features standing out within this broad agricultural valley.

The dairy site is not visible from public vantage points along public roadways and areas along the coastline. Vegetation and topography screen public views of the Māhā'ulepū Valley lowlands. Dairy farm structures will conform to County height limits for agricultural zoned land. The tallest structures of the Hawai'i Dairy Farms facilities will include the milking parlor and the associated storage tanks, all of which are roughly 33 feet in height. These items are in keeping with the agricultural character of the area, and would be expected to have minimal to no impact on public views of the Pu'u Hunihuni crater, views from the Ala Kinoiki Road corridor, or the views of the Hā'upu Mountains surrounding the project.

ARCHAEOLOGICAL AND CULTURAL: The Hawai'i Dairy Farms (HDF) project is subject to a historic preservation review by the State Department of Land and Natural Resources, State Historic Preservation Division (SHPD) under HRS Chapter 6E and Chapter 13-284. An Archaeological Inventory Survey (AIS) and a Cultural Impact Assessment (CIA) were conducted by Scientific Consultant Services (SCS) for the proposed project. EIS Sections 4.7 and 4.8 provide an evaluation of archaeology and cultural resources, with technical studies in Appendix G and H.

A total of sixteen historic properties were identified through a pedestrian survey of the project area and an extended survey area of 100 meters of the northern boundary. Six historic-era sites occur in the project area and 10 sites occur in the extended survey area. Only one of the sites is believed to be associated with pre-Contact and/or early historic times. State Site 50-30-10-2250, the agricultural heiau, and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area. The remaining sites consist of historic-era bridges, ditches, culverts, retaining walls, and a flume system dating from the 20th century and are affiliated with sugarcane cultivation.

That a majority of the documented sites are related to the historic-era is not surprising, given the massive landscape modifications that occurred during intensive sugarcane cultivation on the valley floor. Even historic era cultural materials associated with the many Land Commission Awards in the project area were non-existent, as explored through survey and subsurface exploration.

The sixteen historic properties have been assessed for significance by the archaeological consultant and the dairy project is anticipated to have no impact on these sites. No further archaeological work is recommended for the sites. Two of the sixteen sites are considered significant under multiple criteria, but occur outside the project area on lands owned by a different landowner. Both sites will not be adversely affected by the proposed dairy project. No site is related to burials, and no bonex were found. Such sites have been reported along coastal areas in sand dunes.

The cultural assessment examined the potential effect of the project on cultural resources, practices or beliefs, its potential to isolate cultural resources, practices or beliefs from their setting, and the potential of the project to introduce elements which may alter the setting in which cultural practices take place. Information received from the community indicates the Māhā'ulepū Ahupua'a, has been and is currently used for traditional cultural purposes. However, the dairy project area has not been included in these activities. It is clear that the gathered plants, trails, State Site 50-30-10-2250, the agricultural heiau, and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area.

The project will be fully enclosed by perimeter fencing along the boundary of the leased premises, which will ensure that project activities and any related impacts are contained within the project area. Based on the research and comments received from the community, it is reasonable to conclude that, pursuant to Act 50, the exercise of native Hawaiian rights or any ethnic group related to numerous traditional cultural practices will not be impacted by establishment of the dairy.

ALTERNATIVES: As a part of the DEIS, alternatives were evaluated that could attain the objectives of the action's purpose and need, and were compared with environmental benefits, costs, and risks of each reasonable alternative against those of the proposed dairy project. Further discussion of alternatives can be found in DEIS Section 6.

The DEIS evaluates alternatives that could attain the objectives of the action's purpose and need, and compares environmental benefits, costs, and risks of each

reasonable alternative against those of the proposed action. Additionally, reasonable land use alternatives that emerged from public input during the project scoping phase are documented and briefly discussed. The alternatives that do not meet the project purpose are not advanced for analysis of environmental benefits, costs, and risks. The Environmental Impact Statement Rules, Hawai'i Administrative Rules Chapter 11-200 (HRS 11-200) requires a discussion of alternatives that could attain the objectives of the action, regardless of cost. There is no requirement for the alternatives analysis to consider every possible land use.

Four possible land uses that would not meet the project purpose are discussed. Rezoning the land for resort or residential development, or a potential conservation condemnation are two uses that were examined and eliminated from analysis. These options would not be reasonably viable given the existing private land tenure and existing zoning. Two additional alternatives were considered as reasonable land uses as they could be permitted within the existing State Land Use Agricultural District and County Agricultural Zoning District. These options include Agricultural Park with Processing Center, and development of an Agricultural Subdivision. The alternatives were examined and eliminated from further analysis, however, as they would not fulfill the project purpose.

The analysis, therefore, focuses on alternatives that meet the project purpose. Rigorous exploration and evaluation of the environmental impacts of the alternatives, including those that might enhance environmental quality or avoid, reduce or minimize some or all of the adverse environmental effects, costs and risks. These alternatives include: (1) the development of a Conventional Feedlot Dairy (a non-pasture-based dairy) at the same location; (2) development of the Pasture-Based Dairy at an Alternative Location on Kaua'i; and (3) milk products processing by HDF. The alternative of "No Action" is also evaluated.

The alternatives analysis provides a comprehensive evaluation of the range of potential alternatives, including the two alternative development scenarios. Although the alternatives are potentially reasonable uses under existing zoning and neighboring uses, each fails to comprehensively fulfill the project requirements defined by the eight Project Objectives and the four established Evaluation Criteria (Chapter 2, Sections 2.3.3 and 2.3.4).

The essential differences as compared to the proposed action are highlighted in the following statements.

- Only one of the alternative actions (conventional feedlot alternative) would create a commercial scale dairy operation in Hawai'i, with the capability to produce 10 percent of the State's fresh milk demand thus reducing dependence on imported milk (Objective 1). This alternative, however, would not reduce reliance on costly imported fertilizer and feed (Objective 2); grow local, quality grass as a primary feedstock (Objective 3); and would not utilize 100 percent of manure on site as nutrients to grow forage for dairy cows (Criterion 4).
- None of the alternatives would secure a dairy location that meets the requirements for a pastoral, pasture-based grazing dairy: sufficient

contiguous land area; available long-term land tenure; adequate potable water supply; suitable soil properties; gentle slope conditions; and accessibility (Criterion 1).
- One alternative (Agricultural Park) could potentially generate new long-term employment in the agricultural sector on Kaua'i in a wide range of positions including pasture agronomy/soils science, environmental resources management (Criterion 2).
- The Agricultural Park alternative could also develop sustainable food production utilizing Important Agricultural Lands, demonstrating the importance of long-term agricultural leases and capital investment for agricultural infrastructure, water systems and support facilities. (Criterion 3). However, after years of trying, it appears there was limited interest in such a venture.
- Finally, addressing the range of potential environmental impacts (natural, cultural, social and economic) (Objective 8) the two alternative development scenarios would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.

In contrast to the other options considered, the planned agricultural operation of Hawai'i Dairy Farms, was determined to be the most viable option and is the preferred alternative. Of all the alternatives considered, this is the only approach that achieves project objectives and meets each of the four Evaluation Criteria.

- Hawai'i Dairy Farms will create a commercial scale pasture-based dairy operation in Hawai'i, with the capability to provide more than 1,000,000 gallons of the fresh milk demand, reducing dependence on imported milk (Objective 1).
- The planned dairy location meets the requirements of minimum land area, soil properties, slope conditions, water supply, land tenure and availability, and accessibility (Criterion 1).
- The planned action will generate new long-term employment in the agricultural sector on Kaua'i, including pasture agronomy/soils science, veterinary and animal husbandry, environmental resources management, milk/milk processing, and dairy business management (Criterion 2).
- Sustainable food production utilizing Important Agricultural Lands (Criterion 3) will occur with the proposed action, demonstrating the importance of long term agricultural leases, and the ability to draw capital investment for agricultural infrastructure including water systems and support facilities (Criterion 3).
- Address the range of potential environmental impacts by utilizing 100 percent of manure as natural fertilizer to grow the majority of food for cows (Criterion 4). The alternatives evaluated would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.
- Creating an economically viable pasture rotational-grazing model maintains agriculture, retains open space, and provides buffer between highly utilized resort and residential development and sensitive natural or cultural resources (Objective 8).

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

February 23, 2015

Jeff Overton

Group 70 International, Inc.

925 Bethal Street, Fifth Floor

Honolulu, Hawaii 96813

To Whom It May Concern:

This letter is being written to identify the issues which need to be addressed in the Hawaii Dairy Farms EIS related to the New Zealand Method Dairy Farm projected to be established on Kauai's south shore at Maha`ulepu.

1. Procure an impartial party to conduct the EIS.
2. Assess the current levels of pollution in the soil, stream and ocean at Maha`ulepu.
3. Integrate the conclusions of the existing soil and water quality studies that have been done in the area.
4. Include the projected herd size into the EIS.
5. Address the lethality of the proposed effluent ponds.
6. Address the stench that will permeate the surrounding residential and tourist area and decimate our local tourism economy resulting in lost jobs and access to our pristine beaches in the area.
7. State the cumulative effects on the environment.

Thank you for the opportunity to voice my deep concerns related to developing this dairy farm at Maha`ulepu.

Please notify me of everything that happens on this issue in the future phases of the EIS.

Sincerely,

Carylee Boyd

Carylee Boyd

4460 Ikena Place # 37

Kalaheo, Hi 96741

May 26, 2016

Carylee Boyd
4460 Ikena Place, #37
Kalaheo, HI 96741

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Carylee Boyd:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths –

as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhā'ulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhā'ulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Po'ipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhā'ulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawai'i Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhā'ulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhā'ulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of

groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhāʻulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kauaʻi community.

Regional Water Demand: The adjacent, developed Kōloa-Poʻipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kauaʻi will increase county-wide by 17,300 residents by 2030. The South Kauaʻi population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kauaʻi region (the Kōloa - Poʻipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhāʻulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhāʻulepū watershed.

The HDF site is located on the bottom-land of the upper Māhāʻulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Haʻupu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhāʻulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built

facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kauaʻi Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhāʻulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhāʻulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhāʻulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to

create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Poʻipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the

Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kauaʻi community.

SOILS: Soil is an ecosystem that can be managed to provide nutrients for plant growth, to absorb and hold rainwater for use during dryer periods, to filter and buffer potential pollutants from leaving fields, to serve as a firm foundation for agricultural activities, and to provide habitat for soil microbes to flourish and diversify to keep the ecosystem healthy. Two rounds of independent soil sampling were undertaken at HDF to understand and characterize available soil nutrients and conditions. Section 4.3 of the Environmental Impact Statement (EIS) characterizes soil conditions, and anticipated impacts from effluent and supplemental nutrient application. Recommendations from Dr. Russell Yost and Nicholas Krueger of the University of Hawaiʻi at Mānoa are summarized. Their baseline nutrient report is included as Appendix C of the Draft EIS.
Soil conservation is a core principal behind establishment of the NRCS, which was formed out of the Soil Conservation Service to acknowledge its expanded role in watershed-scale approach using science-based tools and standards in agronomy, engineering economics, wildlife biology and other disciplines to aid landowners in implementation of conservation practices. NRCS conservation practices are listed in Chapter 3, Section 3.2; these practices codes identify design and construction standards related to drainage, materials, operations and applicable engineering standards. HDF will follow the developed Conservation Plan, which was approved by the West Kauaʻi Soil & Water Conservation District in December, 2013.

The United States Department of Agriculture (USDA) Natural Resources Conservation Services (NRCS) has mapped and classified soils for more than 95 percent of the United States. Comments received during the initial scoping for this

EIS included a "Custom Soils Resource Report for Island of Kaua'i, Hawai'i." The report was generated from the USDA NRCS website, which allows any internet user to define an area of interest, customize data results, and generate a Custom Soil Resource Report. The user can select or deselect parameters based upon which data the user would like to display. These user-generated reports are not evaluated by NRCS.

The NRCS soils classifications and descriptions provide a good information base, however, in-field soils testing is needed to identify existing soil nutrient levels and conditions. The most abundant soil types at the HDF site are Kalihi Clay at 32 percent, Ka'ena Clay Brown Variant at 29 percent, and Lualualei Clay at roughly 14 percent of the dairy site. Laboratory analysis of soil samples collected in 2014 identified levels of pH, phosphorus, nitrogen, potassium, calcium, magnesium, organic matter, salinity, micronutrients and other constituents. The results illustrate that the soils are depleted of nutrients, which is typical for lands formerly used for sugarcane. The soil nutrient status and fertility demands of the primary crop, Kikuyu grass, were used to identify the quantities of nutrients required for productive grass growth. The soils data provide a baseline to guide adaptive nutrient management throughout establishment and maturity of the dairy.

A second round of field sampling was conducted in 2015, and focused on evaluation of soils characterized as "poorly drained", and established a quantitative baseline of soil salinity and sodicity to provide for future monitoring of soil health with application of manure effluent. Laboratory analysis determined electrical conductivity and exchangeable sodium percentage, in addition to nutrient levels of nitrogen phosphorus calcium, magnesium, and potassium.

Poorly drained is not an indication of low or poor infiltration. Infiltration refers to the ability of water to enter the soil surface, whereas "drainage" refers to the movement of water within or from the soil profile. Poorly drained soils typically have low hydraulic conductivity, or a slow rate of groundwater movement through the soil. This slow movement can create anaerobic conditions, which typically result in higher rates of denitrification. This is the conversion of potentially nitrates and nitrites to gaseous forms, which reduces the potential for impacts on waterbodies. In this way, "poorly drained" soils may represent less risk of nitrate and nitrite leaching to associated waterbodies than "well drained" soils (Yost, 2016).

As a result of reduced movement of water through the soil profile, the mobility of nutrients such as potassium and phosphorus is also reduced. Soil types at the HDF site are known to adsorb and retain large amounts of phosphorus. Under the NRCS phosphorus leaching index for Hawai'i soils, HDF soils show low risk for leaching. With low risk, phosphorus can be applied at rates greater than crop requirements if manure or other organic materials are used to supply nutrients.

The dairy's focus on robust and healthy grass growth will build organic matter in soils through use of manure as a natural fertilizer. Soil can incorporate carbon from the atmosphere, which benefits soil health. According to recent studies in the Soil Science Society of America Journal, the conversion of formerly tilled cropland to

grazed pasture can drive substantial accumulation of organic carbons in soil, with a potential to offset up to one-third of the annual increase in atmospheric carbon dioxide. The potential soil organic matter and carbon dioxide sequestration benefits are likely greatest in highly degraded soils in warm subtropical climates, partly due to long pasture-growing seasons. Long-term soil impacts are anticipated to result in improvement to the physical, chemical, and biological condition of the soil.

AIR QUALITY: As a part of the Environmental Impact Statement (EIS), existing air quality conditions and project impacts were evaluated, including dust and odor. Potential odors and emission levels for air pollutants relevant to dairy operations were modeled, as currently there are no cows on site. EIS sections 4.19 and 4.25 provide an evaluation of air quality and odors, including a windrose depicting wind speed and direction in the area (see DEIS Section 4.1, Climate). The full air quality technical report can be found in Draft EIS Appendix I.

Clean Air Act

Under the *Clean Air Act of 1970* (CAA), amended November 1990, the U.S. Environmental Protection Agency (EPA) regulates both large and small sources of air pollutants by establishing National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. The State of Hawai'i has established its own *State Ambient Air Quality Standards* (SAAQS) that are as strict or, in some cases more strict than the NAAQS. State standards prohibit any visible emissions of fugitive dust from construction activities at the property line.

Emissions relevant to livestock operation include particulate matter and fugitive dust. Greenhouse gases related to dairy cows include methane (CH_4) from enteric fermentation, and both methane and nitrous oxide (N_20) emissions from manure application. No State or Federal regulations for greenhouse gas emissions from farm operations or small businesses currently exist.

DUST

Dust will be generated as cows move along soft limestone walkways that connect the paddocks and lead to and from the milking parlor. Potential fugitive dust emission rates were estimated from published literature, where particulate matter (PM) is measurable from the "drylots" of confined dairy operations where animals walk over dirt and dried manure throughout the day.

Applying the emission rates from this available literature greatly overestimates potential emission resulting from HDF. Cows in the pastoral rotational-grazing system will be on pasture 22 hours each day and will spend two hours – in two separate milking cycles –moving to and from the barn for the 10- to 15-minute milking sessions.

Using atmospheric dispersion modeling system (AERMOD), the rates were scaled to the size of the non-pasture areas used by cows at HDF. Results were added to the background concentration of particulate matter (both PM_{10} and $PM_{2.5}$) measured on the island of Kaua'i, and the total concentration was compared to the State ambient

air quality standards. Only the contemplated herd size of up to 2,000 mature dairy cows was modeled, as at the lower threshold of 699 cows, the potential fugitive dust impact would be negligible. The estimated concentration for PM_{10} is 2.01 μg/m³, well below the State standard of 150 μg/m³. The estimated concentration for $PM_{2.5}$ is 0.23 μg/m³, well below the Federal standard of 35 μg/m³ (see Draft EIS Section 4.19 and Table 4-19.2).

ODOR

Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF, so air dispersion models were used to determine potential odor levels. Local weather data was used in conjunction with the AERMOD modeling system, and published rates for manure odors emissions for dairy heifers and effluent ponds were adapted to reflect the HDF facilities.

Odor emission sources identified for modeling at HDF were manure in the pasture fields, irrigation water containing diluted nutrients from effluent, the effluent storage ponds, and the dairy buildings. Odor rates from published research were applied. Odor isopleths (a line used to map all points having the same numerical value) were created to display the model findings. Odor is described in "odor units" at the threshold of perception, which is defined by the point at which 50 percent of panelists, in laboratory conditions, cannot smell the odor but 50 percent of the panelists can detect the odor.

Modeling results were generated for worst case meteorological conditions (low wind velocity / mixing). Generally, tradewinds will disperse odors to less than detectable levels beyond the HDF site; in periods of no wind, odor may not be dispersed creating the "worst case" scenario. In these periods without normal tradewind flow, the odor plume would extend to the south of the HDF site. Sections 4.19.2 and 4.25.2 of the EIS include graphics of the potential odor isopleths.

Results for the committed herd size of 699 mature dairy cows show that odors may be detectable by 50 percent of the sensitive population once per 200 hours, or 44 hours per year, within an area that extends approximately 1,670-feet (within one-third of a mile) beyond the dairy farm boundary, and does not reach recreational or residential areas. Results for the contemplated expanded herd size of up to 2,000 mature dairy cows show odors would not extend beyond 2,780 feet outside the HDF boundary (just over half a mile), again not reaching recreational or residential areas, and again with detection limited to 50 percent of the sensitive population approximately 44 hours per year. The parameters used in the analysis were intentionally conservative, and the impacts shown assume an unlikely confluence of worst-case meteorological data, irrigation location, and grazing location. Actual offsite odor impacts are likely to be much lower and/or less frequent than shown; it is likely odor detection beyond the HDF boundaries will be less frequent.

DAIRY OPERATIONS: Hawai'i Dairy Farms (HDF) will establish and operate a sustainable, pastoral rotational-grazing dairy farm in Māhā'ulepū Valley on the island of Kaua'i to produce fresh, locally available nutritious milk for Hawai'i

families. The rotational-grazing method utilizes 100 percent of the cows' manure as natural fertilizer to grow pasture grass as a primary source of nutrition for dairy cows. This cost-effective method will reduce reliance on imported fertilizer and feed. Pasture grass will comprise at least 70 percent of the animals' diet. As a part of the Draft Environmental Impact Statement (EIS), the proposed facilities and operations for the dairy farm are described in Chapter 3.

The Environmental Impact Statement (EIS) Preparation Notice (EISPN), published January 23, 2015, described the proposed pasture-based rotational grazing system as a "zero-discharge, grass-fed dairy". The term "zero-discharge" under the U.S. Environmental Protection Agency related to concentrated feeding operations (CAFO) is a system designed to not discharge pollutants into waters of the United States. As noted previously, the HDF system is designed to utilize 100 percent of the cows' manure on-site. However, nutrients would be introduced to the HDF site with any use; the Draft EIS identifies the amount of nutrients anticipated from the proposed dairy operations that could pass through to ground and surface waters. Therefore, HDF elected to discontinue use of the term "zero discharge" as it was construed as no nutrients into the system.

The term "grass-fed" was used in the HDF EISPN. This term was used to identify HDF's intent to utilize a locally-produced feedstock – grass – for more than 70 percent of the dairy herds' diet. In January 2016, the U.S. Department of Agricultural (USDA) Marketing Survey created a narrow legal definition of "grass-fed". The USDA standard defines what animals can and cannot be fed. The Food Alliance, a project of several northwest colleges, believes that when consumers choose grass-fed products there is an expectation that these will come from animals raised on pasture on a forage-based diet. Due to the evolving definition of "grass-fed", the term in not used in this EIS.

The dairy facilities will occupy an area of approximately 10 acres on the western boundary of the site. The developed area "footprint" will be less than 2 percent of the total farm area. Four buildings will be constructed to serve different functions, supported by utilities and infrastructure. Additional building information can be found in Draft EIS Section 3.3.1.

Agricultural infrastructure and utilities required for the dairy operations will include storage tanks and silos, effluent storage ponds, livestock water systems, and drainage improvements. The irrigation system and distribution of livestock water are discussed in Draft EIS Section 3.5, Pasture Management.

The pastoral rotational-grazing dairy provides a local feedstock – grass – as the herd's primary food source. Reducing imported feed stabilizes costs and provides a food source closer to the natural diet of cows. Results of grass trials initially conducted at five sites across four Hawaiian Islands were instrumental in identifying appropriate varieties of grass, and suitable sites to support sufficient "dry matter" grass yields essential to a cow's diet. Additional project-specific trials at the Māhā'ulepū site on Kauai have been conducted for more than 18 months. The

results have identified sufficient yield and nutrition to supply 70 percent of the cows' diet; improvements in grass productivity are anticipated to provide up to 85 percent of cows' diet.

The pasture-based model allows cows to move about freely, and to lie down and rest, which is part of the digestion cycle. The animals are managed in social groups known as "mobs", mimicking the natural social order of bovines. Cows spend 22 hours of each 24-hour period foraging on pasture or resting, outdoors in natural light and fresh air. The gently sloped paddocks, walkways and races minimize the energy expended by the mature dairy cows as they graze or are transferred to and from the various paddocks and the mature dairy facility; surfaces of the walkways and cow races are designed to provide a comfortable path under hoof. The management practices and pasture model applied by HDF maximizes grass as the cows' primary nutrition source and minimizes stress to the animals. Cows tend to be healthier and live longer, productive lives with access to fresh air, high quality feed, and exercise while they forage.

The 470 acres of pasture will be divided into paddocks averaging 3 to 5 acres in size. Smaller paddocks located near the dairy facility will be used as temporary pasture for cows or calves being moved on or off the farm. To protect the water quality of surface water and downstream areas, paddock fences are set back 35 feet from the edge of drainage ways throughout the site. Existing vegetation within the setbacks will be managed or restored to reduce erosion, improve stability of ditch banks, increase net carbon storage, and improve and maintain water quality.

The majority of the pastures will be irrigated with non-potable water and/or diluted effluent through either the pivot irrigation systems or through gun irrigators. Irrigation water supply is provided to the farm from Waita Reservoir, and will be filtered and pumped to the various irrigation components on the farm. The irrigation system is controlled using computer software and GPS receivers to allow very precise application of irrigation and/or diluted effluent on the pasture. The pivots can rotate and apply irrigation water and/or diluted effluent at different rates depending on the actual irrigation needs of the farm.

NRCS provides technical guidance on applying agricultural waste depending on the desired use of the waste. Reflected in the title of the livestock waste guidance for Hawai'i is the parenthetical inclusion of the word "nutrients." Where waste is utilized as a resource, it is being used for the constituent components that provide benefit.

The NRCS Conservation Practice Standard 590, Nutrient Management, applies to commercial fertilizers, organic by-products, waste water, organic matter, and irrigation water. Nutrient management is the practice of managing the amount, rate, source, method of application, and timing of plant nutrients and soil amendments. The timing and application of nutrients will correspond with plant uptake, soil properties and weather conditions. For more information on nutrient balance management see Draft EIS Section 3.5.3, and Draft EIS Appendix D.

The effluent storage ponds are sized to accommodate 30 days of storage for up to 2,000 mature dairy cows, and over 85 days of storage for 699 mature dairy cows. It will be highly unlikely that the storage pond will be full at any time for the contemplated 2,000-cow dairy, and nearly impossible for the committed 699-cow dairy. Throughout the less than 30-day storage period, effluent is planned for application every four days, and the slurry application is expected at least once every 45 days, to ensure that the ponds are kept at manageable levels.

Cows lactate milk following the birth of calves. Newborn calves will be housed on the Māhā'ulepū site and provided essential colostrum and nutrients for a healthy start. During the calves' initial 90 days, they will be transitioned to pasture at HDF before transfer to ranches on Kaua'i to be raised off-site. The committed herd size of 699 mature dairy cows at the Māhā'ulepū site applies to mature mature dairy cows. Animals in various stages of lactation and rest will be transferred between HDF and other partner ranches as needed for animal health and dairy productivity. This will benefit both the dairy and infuse the beef market in Hawai'i with a new, local source of pasture-raised calves. Male calves will become part of the beef cattle herd; heifers (young female calves that haven't given birth) will be raised until ready to return to the HDF herd as a birthing/mature dairy cow. For more information on off-site herd management, refer to Section 3.7 of the Draft EIS.

Health of the herd is of primary importance as the success of a dairy relies on cows effectively producing quality milk. All cows will be treated with a high standard of care. Dairy managers and caretakers will be trained and competent in handling animals to minimize stress and ensure the herds' welfare. A licensed veterinarian may prescribe use of antibiotics approved by the Food & Drug Administration (FDA) for treatment of illnesses. Adherence to guidelines that prohibit milk from cows undergoing antibiotic treatment will ensure no adulteration of milk. Routine laboratory tests of milk for traces of antibiotic residue will be conducted. FDA-approved hormones may also be used as prescribed by a licensed veterinarian. HDF will not treat cows with bovine growth hormone, referred to as rBST or rBGH.

PESTS: A study of invertebrate species and pest insects was conducted by Steven Lee Montgomery, PhD, Consulting Biologist in January 2016. The study summarizes the presence or absence of native species or pest species associated with cattle manure in the general Māhā'ulepū area, as well as the parasites and predators that control those species. No federally or state listed endangered or threatened invertebrate species were noted in the survey of the site. A full report and list of species found on site is provided in EIS Section 4.11 and Appendix B.

Flies were identified on the HDF site using manure from neighboring livestock as bait for invertebrates. The two flies associated with livestock are the stable fly and the horn fly, the latter known for biting cattle. These flies and the greenbottle fly are often confused with the house fly. Flies known to exist on Kaua'i but not seen at the HDF site include the house fly, the dog dung fly, and the chicken dung fly. These pests are common in areas with high pet populations. It is possible these fly species could inadvertently be brought to the dairy and utilize manure as a food source. HDF will prevent and control fly population growth through diligent clean up and sanitation

practices regarding any trash and food waste, as well as through efficient manure composting practices. A full list of site management measures is provided in EIS Section 4.11. The project location does not provide any habitat for *drosophila musaphilia*, the only Kaua'i species of native Hawaiian fly listed as Endangered or Threatened. Native Drosophila habitat is located many miles away in the high elevation koa-'ōhi'a forests.

Fly populations at HDF will be minimized through a process known as Integrated Pest Management (IPM). Essentially, IPM disrupts reproduction with appropriate means at key points in the pest's life cycle. Used in Hawai'i for decades, a number of invertebrates and a bird (the cattle egret) were introduced between 1898 and 1950 to reduce livestock-related insects. IPM utilizes knowledge of the ancient food web among species.

An especially important insect to minimize fly breeding habitat in manure is the dung beetle, which buries manure and incorporates it into the soil. Populations of dung beetles found on Kaua'i and those species already in Māhā'ulepū Valley, will increase with the increased manure food source, thus increasing and speeding breakdown of manure. Dung beetles are specialists in the very important natural process of breaking up and quickly recycling bovine manure pads. The behavioral diversity among dung beetle species will work together to bury dung pats in one to three days, a shorter amount of time than the 10-30 days flies eggs need to hatch.

In the Kōloa-Po'ipū region, pest fly populations are dependent upon food and breeding sources nearby such as dog, cat, and chicken feces. Beef cattle graze in the region on agricultural lands along Ala Kinoiki Road between Kōloa and Po'ipū, and it is likely the livestock-related flies identified at the HDF site occur in this region as well. Localized controls to reduce pest populations need to address breeding sites in and amongst the food and animals wastes within the area. These mitigation measures will make it difficult for flies to breed, and BMPs will be enforced to address any increase in population, therefore it is expected that the dairy farm will not significantly affect recreational and resort areas.

NOISE: Existing noise conditions of the project site and the surrounding Māhā'ulepū valley area are evaluated in the Draft Environmental Impact Statement (EIS), along with anticipated short-term and long-term noise conditions associated with the dairy farm and planned mitigation actions. Draft EIS Section 4.12 addresses noise conditions.

Noise can be defined as unwanted sound, a sound that is considered loud or unpleasant, and/or sound that causes disturbance. Research related to noise and livestock focuses on noise levels and minimization of unexpected sounds that cause undue stress on cows. Noise stress results in loss of livestock productivity and thereby financial loss to farmers and ranchers. Little research exists on the sound levels from livestock.

Sound is measured in decibels (dB). The State of Hawai'i Department of Health (DOH) rules use the A-weighting sound network (dBA) in the HAR §11-46,

Community Noise Control. Sound through the air is similar to ripples on a pond of water. In open space without reflection, ripples spread uniformly in all directions and decrease in amplitude further from the source. In free field conditions such as outdoors, amplitude drops by half as distance doubles (OSHA, 2016). When sound passes close to absorbing ground cover such as grassland and fields, the "soft ground" absorbs extra sound as it passes. The Hawai'i Dairy Farms (HDF) site in Māhā'ulepū Valley is approximately 2 miles from the resort area, and 1.5 miles from the closest residential areas (on land zoned for agriculture). Typical noise currently generated near the HDF site includes truck ingress/egress along private farm roads, agricultural equipment, and cattle and sheep.

Construction work at the project site will involve activities that may generate an increase in noise levels. However, such exposures will be a short-term condition, occurring during daylight hours. Construction vehicles and activities must comply with DOH Administrative Rules. DOH noise control regulation requires a permit for construction activities that emit noise in excess of 78 decibels or that cost a total of more than $250,000. Mitigation measures to minimize construction noise will include the use of mufflers to suppress loud equipment and limitations on the hours of heavy equipment operation.

The dairy farm will utilize milking equipment contained in the milking parlor, and will use field equipment such as tractors. Under HAR §11-46, agriculture is classified as Zoning District Class C, which specifies maximum permissible sound levels of 70 dBA in the daytime and 70 dBA at nighttime. Dairy operations will generate noise in keeping with agricultural zoning of the parcel. The primary noise receptors in the area would be farmers working nearby parcels. Noise from the dairy will not exceed the DOH threshold, and will not contribute to excessive noise in the region.

DEMOGRAPHIC AND ECONOMIC: The potential impacts of Hawai'i Dairy Farms (HDF) to the existing economy were evaluated in the Draft Environmental Impact Statement (EIS), including a fiscal impact assessment report completed in April, 2016 by Plasch Economics Pacific. Draft EIS Section 4.15 addresses demographic and economic factors, with the complete report in Appendix J.

The HDF project would create short-term benefits through jobs for local construction personnel and local material suppliers. Such jobs would include equipment operators, cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, supervisors, painters, etc. Based on State employment multipliers, indirect employment related to Dairy construction would be expected to average about 16 jobs on Kaua'i, and 8 on O'ahu. Construction employment would be expected to average about 12 jobs per year during the development period. Thus direct-plus-indirect employment association with construction would be expected to average approximately 36 jobs, of which 28 would be on Kaua'i.

The HDF project would contribute to diversification of Kaua'i's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State

(both on the Hawai'i Island), approximately10 percent of Hawai'i's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and indirect full-time equivalent jobs on Kaua'i, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on O'ahu.

HDF is expected to generate a net income of approximately $68,000 to the County when the 699 cow herd is established. When the dairy has matured to full production for the 699 cow dairy, net income to the State is calculated at $160,000 annually. With the potential contemplated herd size of up to 2,000 mature dairy cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be produced. This would double local milk production currently supplied by operational dairies on the Island of Hawai'i.

Additional employment generated by a possible expansion to accommodate the contemplated 2,000 mature dairy cow herd is estimated at approximately 3 construction jobs plus 4 indirect jobs on Kaua'i, and 2 indirect jobs on O'ahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an additional 5 full-time farm jobs would be added, with approximately 15 additional indirect jobs on Kaua'i and another 8 indirect jobs on O'ahu.

The dairy is expected to generate a net additional contribution to the County of approximately $8,000 for improvements related to expansion for the contemplated herd size of up to 2,000 mature dairy cows ($76,000 total versus $68,000 for the committed herd size). The State will derive approximately $360,000 annually in revenues from the contemplated 2,000-mature dairy cow dairy.

Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

ARCHAEOLOGICAL AND CULTURAL: The Hawai'i Dairy Farms (HDF) project is subject to a historic preservation review by the State Department of Land and Natural Resources, State Historic Preservation Division (SHPD) under HRS Chapter 6E and Chapter 13-284. An Archaeological Inventory Survey (AIS) and a Cultural Impact Assessment (CIA) were conducted by Scientific Consultant Services (SCS) for the proposed project. EIS Sections 4.7 and 4.8 provide an evaluation of archaeology and cultural resources, with technical studies in Appendix G and H.

A total of sixteen historic properties were identified through a pedestrian survey of the project area and an extended survey area of 100 meters of the northern boundary. Six historic-era sites occur in the project area and 10 sites occur in the

extended survey area. Only one of the sites is believed to be associated with pre-Contact and/or early historic times. State Site 50-30-10-2250, the agricultural heiau, and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area. The remaining sites consist of historic-era bridges, ditches, culverts, retaining walls, and a flume system dating from the 20th century and are affiliated with sugarcane cultivation.

That a majority of the documented sites are related to the historic-era is not surprising, given the massive landscape modifications that occurred during intensive sugarcane cultivation on the valley floor. Even historic era cultural materials associated with the many Land Commission Awards in the project area were non-existent, as explored through survey and subsurface exploration.

The sixteen historic properties have been assessed for significance by the archaeological consultant and the dairy project is anticipated to have no impact on these sites. No further archaeological work is recommended for the sites. Two of the sixteen sites are considered significant under multiple criteria, but occur outside the project area on lands owned by a different landowner. Both sites will not be adversely affected by the proposed dairy project. No site is related to burials, and no bonex were found. Such sites have been reported along coastal areas in sand dunes.

The cultural assessment examined the potential effect of the project on cultural resources, practices or beliefs, its potential to isolate cultural resources, practices or beliefs from their setting, and the potential of the project to introduce elements which may alter the setting in which cultural practices take place. Information received from the community indicates the Māhā'ulepū Ahupua'a, has been and is currently used for traditional cultural purposes. However, the dairy project area has not been included in these activities. It is clear that the gathered plants, trails, State Site 50-30-10-2250, the agricultural heiau, and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area.

The project will be fully enclosed by perimeter fencing along the boundary of the leased premises, which will ensure that project activities and any related impacts are contained within the project area. Based on the research and comments received from the community, it is reasonable to conclude that, pursuant to Act 50, the exercise of native Hawaiian rights or any ethnic group related to numerous traditional cultural practices will not be impacted by establishment of the dairy.

ALTERNATIVES: As a part of the DEIS, alternatives were evaluated that could attain the objectives of the action's purpose and need, and were compared with environmental benefits, costs, and risks of each reasonable alternative against those of the proposed dairy project. Further discussion of alternatives can be found in DEIS Section 6.

The DEIS evaluates alternatives that could attain the objectives of the action's purpose and need, and compares environmental benefits, costs, and risks of each reasonable alternative against those of the proposed action. Additionally, reasonable land use alternatives that emerged from public input during the project

scoping phase are documented and briefly discussed. The alternatives that do not meet the project purpose are not advanced for analysis of environmental benefits, costs, and risks. The Environmental Impact Statement Rules, Hawai'i Administrative Rules Chapter 11-200 (HRS 11-200) requires a discussion of alternatives that could attain the objectives of the action, regardless of cost. There is no requirement for the alternatives analysis to consider every possible land use.

Four possible land uses that would not meet the project purpose are discussed. Rezoning the land for resort or residential development, or a potential conservation condemnation are two uses that were examined and eliminated from analysis. These options would not be reasonably viable given the existing private land tenure and existing zoning. Two additional alternatives were considered as reasonable land uses as they could be permitted within the existing State Land Use Agricultural District and County Agricultural Zoning District. These options include Agricultural Park with Processing Center, and development of an Agricultural Subdivision. The alternatives were examined and eliminated from further analysis, however, as they would not fulfill the project purpose.

The analysis, therefore, focuses on alternatives that meet the project purpose. Rigorous exploration and evaluation of the environmental impacts of the alternatives, including those that might enhance environmental quality or avoid, reduce or minimize some or all of the adverse environmental effects, costs and risks. These alternatives include: (1) the development of a Conventional Feedlot Dairy (a non-pasture-based dairy) at the same location; (2) development of the Pasture-Based Dairy at an Alternative Location on Kaua'i; and (3) milk products processing by HDF. The alternative of "No Action" is also evaluated.

The alternatives analysis provides a comprehensive evaluation of the range of potential alternatives, including the two alternative development scenarios. Although the alternatives are potentially reasonable uses under existing zoning and neighboring uses, each fails to comprehensively fulfill the project requirements defined by the eight Project Objectives and the four established Evaluation Criteria (Chapter 2, Sections 2.3.3 and 2.3.4).

The essential differences as compared to the proposed action are highlighted in the following statements.

- Only one of the alternative actions (conventional feedlot alternative) would create a commercial scale dairy operation in Hawai'i, with the capability to produce 10 percent of the State's fresh milk demand thus reducing dependence on imported milk (Objective 1). This alternative, however, would not reduce reliance on costly imported fertilizer and feed (Objective 2); grow local, quality grass as a primary feedstock (Objective 3); and would not utilize 100 percent of manure on site as nutrients to grow forage for dairy cows (Criterion 4).
- None of the alternatives would secure a dairy location that meets the requirements for a pastoral, pasture-based grazing dairy: sufficient contiguous land area; available long-term land tenure; adequate potable water supply; suitable soil properties; gentle slope conditions; and accessibility

(Criterion 1).
- One alternative (Agricultural Park) could potentially generate new long-term employment in the agricultural sector on Kaua'i in a wide range of positions including pasture agronomy/soils science, environmental resources management (Criterion 2).
- The Agricultural Park alternative could also develop sustainable food production utilizing Important Agricultural Lands, demonstrating the importance of long-term agricultural leases and capital investment for agricultural infrastructure, water systems and support facilities. (Criterion 3). However, after years of trying, it appears there was limited interest in such a venture.
- Finally, addressing the range of potential environmental impacts (natural, cultural, social and economic) (Objective 8) the two alternative development scenarios would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.

In contrast to the other options considered, the planned agricultural operation of Hawai'i Dairy Farms, was determined to be the most viable option and is the preferred alternative. Of all the alternatives considered, this is the only approach that achieves project objectives and meets each of the four Evaluation Criteria.

- Hawai'i Dairy Farms will create a commercial scale pasture-based dairy operation in Hawai'i, with the capability to provide more than 1,000,000 gallons of the fresh milk demand, reducing dependence on imported milk (Objective 1).
- The planned dairy location meets the requirements of minimum land area, soil properties, slope conditions, water supply, land tenure and availability, and accessibility (Criterion 1).
- The planned action will generate new long-term employment in the agricultural sector on Kaua'i, including pasture agronomy/soils science, veterinary and animal husbandry, environmental resources management, milk/milk processing, and dairy business management (Criterion 2).
- Sustainable food production utilizing Important Agricultural Lands (Criterion 3) will occur with the proposed action, demonstrating the importance of long term agricultural leases, and the ability to draw capital investment for agricultural infrastructure including water systems and support facilities (Criterion 3).
- Address the range of potential environmental impacts by utilizing 100 percent of manure as natural fertilizer to grow the majority of food for cows (Criterion 4). The alternatives evaluated would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.
- Creating an economically viable pasture rotational-grazing model maintains agriculture, retains open space, and provides buffer between highly utilized resort and residential development and sensitive natural or cultural resources (Objective 8).

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

From: Cornelia Boyle
To: HDF; epo@doh.hawaii.gov
Subject: Hawaii Dairy Farms EISPN Comments attached
Date: Sunday, February 22, 2015 5:01:23 PM
Attachments: HDF EISPN letter final.docx

Aloha Ms. McIntyre and Mr. Overton,
Please find my comments for the EISPN for Hawaii Dairy Farms in the attached letter. Thank you in advance for including my comments, and conducting the additional analyses requested.
Mahalo,
Cornelia Boyle
Koloa, HI
808-742-8844

February 22, 2015

Ms. Laura Mc Intyre
Environmental Planning Officer
State of Hawaii, Department of Health
919 Ala Moana Boulevard, Room 312
Honolulu, HI 96814

cc: Hawaii Dairy Farms
c/o Jeff Overton, Principal Planner
Group 70 International, Inc.
925 Bethel Street, Fifth Floor
Honolulu, HI 96813

Dear Colleagues:

I am writing to comment on Hawaii Dairy Farms (HDF) Environmental Impact Statement Preparation Notice (EISPN) which was published in The Environmental Notice on January 23, 2015. By way of this letter, I am requesting to be a consulted party in the applicant's EIS process, and I request that Hawaii Dairy Farms address the following areas in the scope of its EIS.

Figure 1.1 Project Location Map

Please show perimeter of the proposed farm and perimeters/ points of the following neighborhoods/locations: Mahaulepu Beach, Gillen Cottage, Kawailoa Bay, Grand Hyatt Hotel, Poipu Bay Golf Course, Poipu Kai Resort, The Point at Poipu, Makahuena, Poipu Aina, WeliWeli Tract, Kiahuna Golf Village, Koloa Town, Poipu Beach Park, Poipu Gateway Village (proposed). Please compute the distance from the proposed farm perimeter to perimeters and centers of neighborhoods/ locations listed above. In another map, please show the outline of the proposed farm and listed neighborhoods and "impact rings" at 1mile, 2miles, 3 miles and 5 miles from the proposed farm center and from the proposed farm perimeter.

2.1 Purpose and Need for Action

"Clean, cost-effective, and sustainable method"

The applicant should provide evidence and supporting documentation for concluding that the proposed action is "clean, cost effective and sustainable." What criteria are being used to make these statements and how does the proposed action measure up against selected criteria?

"Suitable soils"

According to the National Resource Conversation Service Custom Soil Resource Report for Island of Kauai dated June 2014, the soils on the proposed site are very limited in their ability to support an animal waste operation**. "Poor performance and high maintenance should be expected."** The applicant must address the soil properties of the site and discuss the limitations of the soils with respect to absorption, saturation rate, ponding and standing water of each soil type encountered on the farm, and address the probability of storm water runoff. Further, the applicant should address why, given the poor characteristics of the soils, this location was selected. How does the applicant intend to prevent storm runoff from reaching streams and the ocean?

2.3 Proposed Action

"Grass –fed"

What are the USDA requirements for a dairy to be considered "grass fed"? Please demonstrate how HDF meets these standards.

"Locally available nutritious milk"

What local entity will process the milk? Where is the facility located, and what agreements are in place to ensure that Kauai milk is returned to Kauai? How long is the duration of proposed processing agreements? How much milk (Hawaii produced and imported) is currently available today, and how much is really needed over the next 5 years?

"Zero- point source discharge, meaning 100% of the cow's manure will remain on the farm as fertilizer for the pasture grass"

Please discuss how much manure and urine is deposited by each cow each day, and how much is deposited by 699 cows and by 2000 cows at full scale production. Please provide the total amount of manure and urine left in each active grazing paddock. How many paddocks are in use each day for 699 cows and for 2000 cows?

Please describe how and when manure becomes available for nutrient uptake for grass, and what happens when excess manure remains on pasture grass. Given that most of the grazing paddocks are on soils that do not drain, please describe what will happen in sudden rain events which are typical for this area. Please assess how much rain can fall in what period of time before the poor soils are saturated and excess water runs into ditches, streams and ocean.

Please describe how and when the grazing paddocks will be fertilized. Describe how frequently liquid effluent, solid sludge, and direct manure will be applied to the grazing paddocks, and in what proportions. Please explain what chemical fertilizers, in addition to manure and effluent, will be applied to grasses and in what form: sprayed, granular, other??

Please provide a detailed description of the equipment that will be used to apply effluent, and how equipment operates in a variety of wind conditions. How far will effluent spray travel over a variety of typical scenarios for the region: 15-20 mph trade winds, 2-5mph variable winds, 20-25mph kona winds., among others. How will effluent spray be contained?

The County of Kauai General Plan states that non-point discharges have greater impact on streams and waters than point source discharges. Please describe how the farm's activities are not contrary to the Hawaii Coastal Non-Point Pollution Control Management Plan (1996)

"Field trials of kikuyu varieties . . . by horticultural experts"

Please provide results of grass trials. What are criteria for success? Who are the horticultural experts? Please provide their backgrounds and levels of expertise to perform the analysis of the grass.

"Waste Management Plan reviewed by DOH"

What are the EPA's specific requirements used by DOH to review the waste management plan? The draft EIS must address full scale production at 2000 cow level, not just 699 cows.

"Establish herd . . . over several years"

What specific criteria will be used to increase herd size? Where is specific location of local ranching partners' acreage? How many offsite locations will be utilized? How many heifers, non-milking cows, calves, and bulls will be moved off site, and what is expected distribution of animals by type? At full production of 2000 cows, on average how many offsite animals will there be? How will their nutritional and water needs be met? Please describe average density of off-site animal plan relative to acreage available from local ranching partners.

2.4 Alternatives

No Action Alternative

The Kauai County General Plan, which is intended to improve the physical environment of the County and the health, safety, and general welfare of Kauai's people, states that one key goal is to preserve Kauai's rural character by promoting and preserving **"open agricultural lands as a key element of Kauai's character, essential to is image as "The Garden Island" and to the continued viability and development of Kauai's visitor industry. "** In addition, the General Plan seeks "**to develop revenue producing uses that are sensitive to the area's unique qualities."**

The proposed industrial dairy is in direct conflict with the Kauai County General Plan because it creates significant adverse impacts to the adjacent established resort neighborhood and which risk the viability and continued growth of Kauai's major visitor industry already in place on the South Shore. The applicant should address how the size and scope of a 2000 head dairy will add to the continued viability and development of Kauai's visitor industry.

Our landscapes attract visitors from around the world and have economic value. The South Shore of Kauai has many unique geographic qualities, including word famous Poipu Beach, the lithified cliffs along the Mahaulepu Trail, the Makauwahi Cave, just to name a few. The applicant should address how these unique features will be protected from harm.

Alternative Dairy Location

The applicant states that required location criteria include suitable soils, 500-600 acres of usable gently sloped land, reasonably priced water, roadway access, potable water, and irrigation water.

The plan should detail what other sites across Hawaii were evaluated and ultimately eliminated, and discuss specific criteria that led to their elimination from consideration, specifically:

- What other Grove Farm parcels were considered and rejected?
- What other landowner parcels in Kauai (Gay and Robinson, Hawaiian Home lands, etc.) were considered and rejected?
- What other Important Agricultural Lands were considered and rejected?
- What discussions were completed with State of Hawaii DLNR or DOA regarding State Agricultural Park Programs and availability of other state lands?
- What other parcels on other islands were considered and rejected?

Ulupono Initiative has announced that it is evaluating the purchase of Cloverleaf Farms, a 900 acre, 700 head dairy already operating on the island of Hawaii. The applicant should explain how the existing facilities, operational inputs, and soil conditions of the Cloverleaf parcel fit the stated ideal location criteria. In addition, the applicant should review the Cloverleaf location with respect to the 13 significant impact criteria so that the public can compare the stated benefits and adverse impacts of the two locations. Specifically, the study should describe the Cloverleaf location relative to its nearby population center, the economic base of the adjacent neighborhood, the role of the visitor industry, adjacency to surface water streams and the ocean, location of watersheds and public drinking water supplies. Explain why the Cloverleaf location, which already has needed operational inputs, cannot be enhanced to achieve the stated goals of Hawaii Dairy Farms.

Confined Dairy Operation. What specific criteria would be used to assess the possible location of a confined dairy operation, and why would Mahaulepu Valley be considered a suitable location for such an operation? Why would Hawaii Dairy Farms consider this model of industrial farming? What are the risks and rewards benefits of this model?

"New Zealand Model". Moreover, the proposed intensive rotational model has come under great criticism in New Zealand for its negative impact on the environment, including contamination of rivers and streams. If Hawaii Dairy Farms is using such a model, what is being proposed that is different to result in a different outcome? Why should we believe that the experience of Hawaii Dairy Farms will be any different from New Zealand farms that have caused great harm to the environment?

3.0 Environmental Setting

Unfavorable soil type means high probability of contaminated runoff. The predominant soil type is clay based and poorly draining. Based on the NRCS Custom Soil Resource Report referenced previously, the soils on the farm are **very limited** in their ability to dispose of wastewater by irrigation. There is a clear conflict between the applicant's claim that the location provides "suitable soils" (*Ref. Hawaii Dairy Farms EISPN, section 2.1)* and the NRCS report that the soils are very limiting for an intensive animal feeding operation and land application of animal waste. "Poor performance and high maintenance can be expected." *(Ref. NRCS Custom Soil Resource Report for Island of Kauai, Hawaii, June 5, 2014)*

The plan needs to address the severe limitations of the soils on the farm, why this location has been selected, despite the poor soil properties, and the high probability of contaminated runoff.

Upslope from adjacent coastal zone. The location is upslope from the nearby coastal zone and flanked by two ridges on either side. This poor location means that all excess water from rain events will eventually make its way down to the coastal zone by way of ditches, streams and rivers. Moreover, any serious rain event will send excess rain water down the ridges and on to the valley floor. The plan needs to address how surface water and ground water will flow across the site, and discuss the probability of excess manure laden water leaching into groundwater and spilling into Class 1 surface waters, including the Pacific Ocean.

Location prone to intense rain events. Rain events in Mahaulepu can be intense. Anyone who lives or works in the area knows this. "Kona" or southern winter weather storms are particularly laden with moisture which hits up against Haupu and drops heavy levels of rain suddenly in short periods of time. The plan needs to address the limitations of the site during peak rain events, not averages. The plan should model what would have happened in 2006 during Kauai's famous "40 days of rain event". Moreover, climate change scientists predict an increase in intensity and frequency of hurricanes and severe storms. The applicant has the responsibility to address the cumulative effect of climate change on the farm location and the management of water and effluent runoff.

Proximity to public drinking water wells and recharge zones. Kauai depends on ground water for potable water. The proposed location sits on the watershed that makes up the groundwater aquifer which feeds the public drinking water supply for Koloa and Poipu. The plan needs to include a detailed groundwater study, including rate and direction of flow and assessment of the impact of nitrate, bacteria, and manure leaching into the soil and through to the groundwater. Please provide a map which shows the perimeter of the farm, the public drinking wells for Koloa/Poipu, the recharge zones for the wells, and the effluent spray areas. Please provide exact distances from the Koloa/Poipu drinking wells and the perimeter of the farm.

Surface Water Resources and Impacts. The applicant should address the age, quality and condition of the various irrigation pipes and systems which cross the proposed farm. The Waiopili Stream is already impaired, per the monthly water testing from the Blue Water Task Force, Surfrider Foundation. What steps are going to be taken to address the current impairment and return the surface water to acceptable levels of contaminants before reaching Class 1 waters?

Ground Water Impacts. Please prepare a topographic map which shows the proposed farm, the underlying watershed and aquifer of the proposed farm. Please show the location of the public drinking water wells, relative to the perimeter of the farm, and denote distance from the farm to the public water wells. Please complete a detailed hydrology study of the water shed and the recharge zones for the public water supply. Please address how ground water quality will be monitored.

Prevailing trade winds bring odor, vector, and contaminated irrigation mist into population centers. The proposed location is in direct line with the prevailing north-east trade winds, the strongest and most persistent on the entire island. Winds generally blow in from the north east, and as the winds hit the cliffs at Kipu, they compress and pick up velocity and run parallel to the coast, in direct line to the major population and visitor destination centers of Poipu and Koloa, including the Grand Hyatt Hotel and Poipu Beach Park, County of Kauai. These winds will carry farm odor, flies, methane, and particulates from paddock irrigation. "There is no wind break or barrier sufficient to mitigate these prevailing winds." (*Ref. Chuck Blay, PhD.*) The plan needs to address the high probability of wind borne pollution into existing population centers, visitor destination areas, and county parks. The plan should also address the impact of 2000 cows on greenhouse gases.

4.0 Probable Impacts and Mitigative Measures

4.1 Short Term Impacts

How many construction jobs will be created and for what period of time? What is the expected value of these jobs? What measure will be taken to mitigate noise, dust, and other impacts from construction?

4.3. Significance Criteria

The proposed action triggers multiple significance criteria. The applicant must address the possible impacts described below.

Significance Criteria: Involves an irrevocable commitment to loss or destruction of any natural or cultural resource.

Mahaulepu and adjacent lands are sacred to the Hawaiian people, and there are many burial sites across the area. The applicant must complete a detailed archeological review of the area including the location of known petroglyphs, heiau, and burial sites. The farm cannot be viewed as a self-contained island that will not have impact on neighboring areas. In scoping the impacts, the geographical unit should begin with the ahupua`a, and extend beyond the geographic boundaries of the farm so as to ensure that the impacts that occur beyond the boundaries of the farm are assessed.

"The Mahaulepu Coast offers varied and readily accessible recreation activities in a wilderness type atmosphere." (NPS p. 43) Moreover, "This little corner of Kauai [Mahaulepu] contains the most extensive, best-documented continuum of history of any single locality . . . of the Hawaiian archipelago. Geologically, in addition to Waimea Canyon and Na Pali, Mahaulepu is one of its gems." (Chuck Blay, PhD. Kauai's Geologic History, A Simplified Overview.

Significance Criteria: Curtails the range of beneficial uses of the environment

The soil cannot be changed, the winds cannot be redirected, the watershed cannot be diverted, and the rain won't fall in a different place. These major negative features of the farm's proposed location will have significant adverse impacts on the beneficial uses of the adjacent areas, specifically:

- ***Beneficial use of Mahaulepu Beach and Waiopili Stream***. According to the South Kauai Community Plan, "Mahaulepu Beach functions as a de facto beach park and recreational area". The mouth of the Waiopili Stream is a popular place for children to play in its shallow waters before releasing to the ocean. It is a common sight to see children wading and laying in the shallow waters at the mouth of the stream and adjacent tidepools. Families will no longer be able to enjoy this part of the beach due to high contamination caused by surface water runoff that courses over the grazing paddock laden with manure, enters the ditches, and ends up in the Waiopili stream and ocean. The plan needs to address the probability of contaminated runoff at the mouth of Waiopili and the beach at Gillen Cottage. The mouth of the stream is already polluted, and actions must be taken now to inform the public of the current impaired status of the stream. The applicant and landowner must identify an action plan and completion schedule to restore the site to healthful standards.
- ***Impacts to Recreational Activities***. "The Mahaulepu Coast offers varied and readily accessible recreation activities in a wilderness type atmosphere." (*National Park Service Reconnaissance Study p. 43*) Specifically, Mahaulepu Beach and adjacent waters are a popular spot for many water sports, including swimming, windsurfing, kitesurfing, and paddling. The reef areas in front of Waiopili Stream and Gillen Cottage are considered some of the best waters for kitesurfing and windsurfing. Participants in these water sports have the potential to be exposed to contaminated waters which come from the farm and would risk contracting illnesses borne in the surface water.
- ***Impacts to small businesses dedicated to the visitor industry.*** Many small businesses operate visitor tour companies in the adjacent areas, including hiking and walking tour companies, horseback trail rides, ATV and adventure outfitters. The high probability of odor, flies, and contaminated water will damage the quality of the product offered by these companies, especially along the Mahaulepu Coast Trail. The applicant needs to address how small businesses who utilize the area will not be significantly impacted by the dairy farm. The applicant needs to address the reputational risk for these companies through such outlets as customer reviews on TripAdvisor, Yelp, and other on-line outlets.
- ***Impacts hunting and gathering rights***. Fences surrounding the grazing paddocks will limit access to hunting and gathering areas in the valley and may disrupt wildlife corridors. The applicant needs to address the impact substantial fencing will have on wildlife movement and hunting practices.
- ***Impacts to access rights -Public Access Shoreline Hawaii (PASH)***. The applicant needs to address the potential adverse impact the dairy operation may have on Native Hawaiian access rights and the ability to travel freely between tracts of land, especially for gathering plants, wood, and other natural resources.
- ***Impacts ancient Hawaiian trails***. Pursuant to HRS Chapter 198D (Na Ala Hele Program), the applicant must identify the existence of ancient Hawaiian trails through the property, especially through the fenced grazing areas.
- ***Impacts fishing and gathering***. The nearshore waters of Mahaulepu are known as "prime fishing areas" and include ulua, papio, and oio. (NPS Park studyp.26). It is highly probable that dairy operations will introduce excess nutrients to the waters, clearly compromising local fishing, spearfishing, and gathering opportunities.
- ***Impacts critical habitat for endangered arthropods*** (cave wolf spider and cave amphipod) may also be compromised as these arthropods rely on nutrient-rich seepage from water in the cave. According to the National Park Service "The Waiopili Stream joins with natural springs and is linked hydrologically to the cave." The applicant must address how the water will remain clean all the way to the cave, especially when the cave floods.
- ***Impacts beneficial use by marine life***. The health of large marine animals may be compromised should the dairy be allowed to operate in its proposed location. The dairy will utilize drainage ditches which link to the Waiopili Stream which discharges into the Pacific Ocean at Mahaulepu Beach. Mahaulepu Beach is a successful monk seal pupping area, and monk seals are frequently sighted resting at Kawailoa. The water in the Waiopili Stream is already highly polluted (reference to other sections) and poses a health risk to these endangered animals. Green sea turtles (honu) also feed in the shallow waters on algae and sea grasses and bask on open beaches. The applicant must address how their operations pose no risk to marine life

Significance Criteria: Substantially affects the economic or social welfare of the community or State

Incentives to HDF. Hawaii Dairy Farms has announced that it will invest $ 17.5 million in startup costs without government subsidies, and spend $ 6 -9 million a year to operate the dairy in Mahaulepu Valley. Please describe the components of the $ 17.5 million investment. Please describe how many short term jobs (due to construction) and long term jobs (from on-going operations) will be created. How many tax dollars are expected to go to the County of Kauai, the State of Hawaii, and the Federal government as a result of this investment, both short term and long term? Please evaluate the economic value of the proposed dairy farm to local ranching partners for receiving heifers, bulls, and calves from HDF.

Since the proposed location is designated "Important Agricultural Land," please describe the tax credits, tax abatements, and other incentives that HDF will receive, and the total value of these incentives. For what period of time will these incentives be awarded, and what incentives, if any, have already been received? Given these financial incentives, what is the true out of pocket investment that HDF will incur both at start up and as an on-going enterprise.

Substantial Impact on visitor industry. The proposed industrial farm is located too close to the vibrant resort community of Poipu/Koloa. This area is the largest visitor destination on the whole island (South Kauai Community Plan). I estimate that it represents over $ 500 million in annual visitor expenditures and more than 5500 jobs for the visitor industry alone. (Hawaii Tourism Authority Key Statistics 2014).

The Grand Hyatt is the largest non-government employer in the County. Moreover, the adjacent neighborhood represents more than $26 million or 23% of the 2014 property tax revenues of the County of Kauai. These values will be at risk due to the degradation of environmental quality that the proposed farm will bring including odor, noise, flies, and other nuisances.

The applicant must address the current economic contribution of the Poipu/Koloa community to the County of Kauai with respect to:

- Jobs
- Property tax revenues
- Visitor spending,
- Property values,
- Transient accommodation taxes,
- General excise taxes

The risk to the reputation of the Poipu/ Koloa visitor area is significant and must be addressed. According to the Hawaii Tourism Authority, two thirds of visitors to Kauai are repeat visitors. By changing the environment with respect to air quality, water quality, and overall ambience, visitor satisfaction can be impacted. And with the immediacy of on-line communications and visitor sites such as TripAdvisor, Yelp, and others, this reputation can be damaged quickly and irreparably.

Substantial impact on local economy and future projects. A number of new housing developments have been approved, but not yet started in the adjacent neighborhoods. Please show the proposed location of the farm relative to Poipu Gateway Village (South Kauai Community Plan) and the new housing communities around Kiahuna Golf Village. The attractiveness of these development projects will be reduced. The applicant should address the economic loss to the construction industry and related businesses should these projects not be constructed due to their proximity to an industrial dairy.

Significance Criteria: Substantially affects public health, and involves a substantial degradation of environmental quality

The location of HDF in Mahaulepu Valley will cause substantial degradation of environmental quality in the adjacent coastal zone and in the nearby visitor destination center of Poipu-Koloa. The farm cannot be viewed as a self-contained island that will not have impact on neighboring areas. In scoping the impacts, the geographical unit should begin with the ahupua`a, and extend beyond the geographic boundaries of the farm so as to ensure that the impacts that occur beyond the boundaries of the farm are assessed.

Air quality degradation. As described in the HDF Waste plan, high pressure guns will spread diluted manure in a 65 foot radius and spread mist that can travel miles. Coupled with the prevailing trade winds, these odiferous mists will travel directly into the neighborhoods of Poipu and Koloa, causing 2500 residents and an estimated 400,000 visitors a year discomfort and distress, and risking their health.

Moreover, Poipu Beach Park is one of the most popular parks in the County of Kauai public park system. Families from all over the island frequent the park for major events. Their enjoyment of the park will be compromised and their health will be endangered. The applicant needs to address how it will prevent farm odor from reaching population centers and public parks.

Surface water degradation. Manure and nitrogen will be discharged by cows in the paddocks and left on the land. This manure can be moved by storm water to surface streams and groundwater aquifers. Excess runoff from paddocks irrigated with manure laden water will flow from the storm ditches to Waiopili stream to the Pacific Ocean (Class 1 waters). The high probability of contaminated runoff is exacerbated by the poor soil properties of the farm. According to the NRCS Custom Soil Resource Report, June 2014, the soil is ***very limited*** in its ability to handle an animal waste operation. The stream is already highly contaminated as shown by the Blue Water Task Force, Surfrider Foundation.

One theory of this stream pollution is that feral animals are causing the impairment. If this is the case, then what will happen when 2000 more animals are on the land, with manure and urine being left in place. There is significant risk of further pollution to receiving ocean waters. The applicant should address why it has chosen this location with proven unsuitable soils and already impaired streams, and how it will prevent contaminated runoff from reaching the Waiopili Stream and Pacific Ocean.

Public drinking water contamination. Kauai relies on groundwater for its potable water. The proposed dairy location is too close to public drinking water source Koloa Well F and should be rejected. The dairy site is on the watershed that feeds the aquifer for public water wells. Nitrate, bacteria and manure can leach into the groundwater and contaminate the drinking water supply. The applicant should complete a detailed groundwater study, including such topics as the exact location of the well recharge zones, as well as where groundwater recharged by the dairy discharges to wetlands, streams, and springs.

The plan should address the location of the calf cemetery relative to water sources, both surface and groundwater, and describe all actions that will be taken to avoid contamination of water by dead animals. The plan should identify all wetlands in the area.

In addition, locals report that there are fresh water springs that bubble up on the beach near Gillen Cottage and appear in the Makauwehi Cave. The plan needs to demonstrate the hydrological link, or lack thereof, between these springs and the groundwater underneath the proposed dairy.

Biting flies. Massive amounts of manure left on the paddocks by grazing cows create a moist and attractive breeding environment for sucking flies that exist on blood meals. According to Carlos White, Industrial Entomologist (letter to Mayor Carvalho , dated October 13, 2014) "one fertile fly can result in billions of descendants within a few months' time" . . . the house fly is capable of at least a 5 mile dispersal from its origin, and probably more with the winds of Kauai, this would include much of the Poipu area . . . would be subject to clouds of very high fly populations throughout the year." The plan must address how fly populations will be prevented from reaching and injuring the local and visitor populations. Specifically, the plan should address what types of chemicals and integrated pest management systems will be employed, and address why these systems will be effective when other large industrial dairies have not been successful in controlling flies or other vector.

Noise. Calves are typically separated from their mothers 3 days after birth. This results in loud bawling from the calves and distress calls from the mothers, day and night. Moreover, cows in heat call loudly for three days or more. This noise cannot be controlled or suppressed. The applicant should address how this noise will not constitute a nuisance and noise pollution, especially at night, when the trade winds typically abate. The plan also should address how the constant humming of the milking machinery and irrigation systems will not disturb the nearby residential community and visitor destination area.

Animal disposal after useful life. The plan needs to address the disposition of animals that are no longer productive for the farm, including the killing of bull calves and dying cows. How and where will animal carcasses be processed? At the 2000 herd level, how many animals are expected to be culled on a yearly basis and where will remains be processed and handled? Describe in detail the location of the proposed calf cemetery, its capacity, and processing procedures. Where is it located relative to public drinking water and wetlands? What specific policies and procedures will be followed to protect ground water from decomposing animals? What emergency policies and procedures have been detailed in the event of a flood, hurricane, or other serious weather event? What specifically constitutes an emergency?

Significance Criteria: Is individually limited but cumulatively has a considerable effect upon the environment or involves a commitment for a larger action

The HDF plan does involve a commitment to a larger action (from 699 to 2000) which must be addressed now. All nutrient management plans and waste management plans must be detailed at the 2000 cow level.

Conclusion – Analyses will show that the proposed location must be rejected.

The additional analyses requested above will show that Hawaii Dairy Farms has chosen a location in Mahaulepu Valley that is unable to support its intensive rotational farm model without creating significant adverse impacts to the environment, injuring the successful and vibrant economic base, and the hurting the public health of the well-established local residential and visitor community of Poipu/Koloa.

Thank you,

Cornelia Boyle

corneliaboyle@gmail.com

1542 Pe`e Road, Koloa, HI 96756

808-742-8844

RECEIVED
SAFE DRINKING
WATER BRANCH
DEC 24 2014

December 18, 2014

Ms. Joana Seto
Department of Health
Safe Drinking Water Branch
P.O. Box 3378
Honolulu, HI 96801-3378

Dear Ms. Seto:

My name is Cornelia Boyle, and I have been a property owner and tax payer in Poipu Kai, Koloa, Kauai since 1994. I am writing to you today to express my grave concern about the large industrial dairy proposed for Maha'ulepu Valley under the name Hawaii Dairy Farms (HDF).

By way of this letter, I am also informing you and other government officials that I wish to be a consulted party in the preparation of the Environmental Impact Statement (EIS) by Hawaii Dairy Farms. I have already subscribed to The Environmental Notice.

I am pro ag, and I believe it is in our best interests in Kauai to develop more sustainable, more local sources of food. Nonetheless, Hawaii Dairy Farms is too large a project to operate successfully in such a sensitive area as Maha'ulepu. It is the wrong project in the wrong place. It is a large scale industrial dairy that brings many significant risks to our environment, our livelihoods, and our way of life. It offers minimal benefits to our community.

The risks are numerous:

1. **Potential contamination of our drinking water**. The proposed farm is too close to Koloa Wells C, D, and F, the source of our drinking water. Moreover, according to HDF's plan, it is precisely the land nearest the wells that will have additional applications of manure sludge.
2. **Poor soil characteristics**. The Natural Resource Conservation Service (NRCS), a department of the USDA, published a custom soil study in June, 2014 that concluded that the soil in most of the parcels where the farm would operate are incompatible with an agricultural waste management operation and **very limited** in the ability to handle the spreading of animal waste, calculated to be 3 million pounds of manure a month! This poor soil condition leads to:
3. **Potential for significant contaminated runoff**. Since the soil is predominantly clay based, during a rain event, the manure laden water will not percolate in the soil and will run instead into the various streams on the property and into the ocean, polluting the beach and ocean reefs at Maha'ulepu. Moreover, according to testing done by the Blue Water Task Force of the Surfrider Foundation, the streams are already significantly polluted, and not one cow has even set foot on the property.
4. **Intensive farming is the wrong model in the wrong place**. The so-called "New Zealand Dairy Model" has been shown to cause significant pollution of rivers and streams in New Zealand. Why would we embrace a farming model that has already proven disastrous elsewhere?

5. **Proximity to key tourist destinations, residential areas, and businesses**. This industrial dairy will generate odor and attract swarms of flies, thus endangering the very reason that so many people come to visit the south shore of Kauai. The south shore represents 25% of the tax base of our County. Gaining 10-15 jobs at the expense of the thousands who will be affected is not a sufficient benefit to go forward in this location.
6. **Potential degradation of Hawaiian archeological and cultural sites** and severe impact to cultural practices.

Ms. Seto, there is a lot of open land in Kauai. Surely Grove Farm, the current landowner, can assist HDF in finding another parcel that does not risk such significant damage to the environment, health risk to residents, and economic risk to our South Shore businesses. Surely, there is another land owner on the island who can offer a more hospitable home for HDF.

Please help us protect our public health, our tax base, and our oceans and reefs.

Mahalo and aloha,

Cornelia Boyle

Email:corneliaboyle@gmail.com
Mail address: P.O. Box 1300, Koloa, HI 96756
Residence: 1542 Pe'e Road , Koloa, HI 96756

GROUP 70 INTERNATIONAL

May 26, 2016

Cornelia Boyle
1542 Pe`e Road
Koloa, HI 96756
corneliaboyle@gmail.com

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Cornelia Boyle:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

DAIRY OPERATIONS: Hawai'i Dairy Farms (HDF) will establish and operate a sustainable, pastoral rotational-grazing dairy farm in Māhā'ulepū Valley on the island of Kaua'i to produce fresh, locally available nutritious milk for Hawai'i families. The rotational-grazing method utilizes 100 percent of the cows' manure as natural fertilizer to grow pasture grass as a primary source of nutrition for dairy cows. This cost-effective method will reduce reliance on imported fertilizer and feed. Pasture grass will comprise at least 70 percent of the animals' diet. As a part of the Draft Environmental Impact Statement (EIS), the proposed facilities and operations for the dairy farm are described in Chapter 3.

The Environmental Impact Statement (EIS) Preparation Notice (EISPN), published January 23, 2015, described the proposed pasture-based rotational grazing system

as a "zero-discharge, grass-fed dairy". The term "zero-discharge" under the U.S. Environmental Protection Agency related to concentrated feeding operations (CAFO) is a system designed to not discharge pollutants into waters of the United States. As noted previously, the HDF system is designed to utilize 100 percent of the cows' manure on-site. However, nutrients would be introduced to the HDF site with any use; the Draft EIS identifies the amount of nutrients anticipated from the proposed dairy operations that could pass through to ground and surface waters. Therefore, HDF elected to discontinue use of the term "zero discharge" as it was construed as no nutrients into the system.

The term "grass-fed" was used in the HDF EISPN. This term was used to identify HDF's intent to utilize a locally-produced feedstock – grass – for more than 70 percent of the dairy herds' diet. In January 2016, the U.S. Department of Agricultural (USDA) Marketing Survey created a narrow legal definition of "grass-fed". The USDA standard defines what animals can and cannot be fed. The Food Alliance, a project of several northwest colleges, believes that when consumers choose grass-fed products there is an expectation that these will come from animals raised on pasture on a forage-based diet. Due to the evolving definition of "grass-fed", the term in not used in this EIS.

The dairy facilities will occupy an area of approximately 10 acres on the western boundary of the site. The developed area "footprint" will be less than 2 percent of the total farm area. Four buildings will be constructed to serve different functions, supported by utilities and infrastructure. Additional building information can be found in Draft EIS Section 3.3.1.

Agricultural infrastructure and utilities required for the dairy operations will include storage tanks and silos, effluent storage ponds, livestock water systems, and drainage improvements. The irrigation system and distribution of livestock water are discussed in Draft EIS Section 3.5, Pasture Management.

The pastoral rotational-grazing dairy provides a local feedstock – grass – as the herd's primary food source. Reducing imported feed stabilizes costs and provides a food source closer to the natural diet of cows. Results of grass trials initially conducted at five sites across four Hawaiian Islands were instrumental in identifying appropriate varieties of grass, and suitable sites to support sufficient "dry matter" grass yields essential to a cow's diet. Additional project-specific trials at the Māhāʻulepū site on Kauai have been conducted for more than 18 months. The results have identified sufficient yield and nutrition to supply 70 percent of the cows' diet; improvements in grass productivity are anticipated to provide up to 85 percent of cows' diet.

The pasture-based model allows cows to move about freely, and to lie down and rest, which is part of the digestion cycle. The animals are managed in social groups known as "mobs", mimicking the natural social order of bovines. Cows spend 22 hours of each 24-hour period foraging on pasture or resting, outdoors in natural light and fresh air. The gently sloped paddocks, walkways and races minimize the energy expended by the mature dairy cows as they graze or are transferred to and from the various paddocks and the mature dairy facility; surfaces of the walkways

and cow races are designed to provide a comfortable path under hoof. The management practices and pasture model applied by HDF maximizes grass as the cows' primary nutrition source and minimizes stress to the animals. Cows tend to be healthier and live longer, productive lives with access to fresh air, high quality feed, and exercise while they forage.

The 470 acres of pasture will be divided into paddocks averaging 3 to 5 acres in size. Smaller paddocks located near the dairy facility will be used as temporary pasture for cows or calves being moved on or off the farm. To protect the water quality of surface water and downstream areas, paddock fences are set back 35 feet from the edge of drainage ways throughout the site. Existing vegetation within the setbacks will be managed or restored to reduce erosion, improve stability of ditch banks, increase net carbon storage, and improve and maintain water quality.

The majority of the pastures will be irrigated with non-potable water and/or diluted effluent through either the pivot irrigation systems or through gun irrigators. Irrigation water supply is provided to the farm from Waita Reservoir, and will be filtered and pumped to the various irrigation components on the farm. The irrigation system is controlled using computer software and GPS receivers to allow very precise application of irrigation and/or diluted effluent on the pasture. The pivots can rotate and apply irrigation water and/or diluted effluent at different rates depending on the actual irrigation needs of the farm.

NRCS provides technical guidance on applying agricultural waste depending on the desired use of the waste. Reflected in the title of the livestock waste guidance for Hawaiʻi is the parenthetical inclusion of the word "nutrients." Where waste is utilized as a resource, it is being used for the constituent components that provide benefit.

The NRCS Conservation Practice Standard 590, Nutrient Management, applies to commercial fertilizers, organic by-products, waste water, organic matter, and irrigation water. Nutrient management is the practice of managing the amount, rate, source, method of application, and timing of plant nutrients and soil amendments. The timing and application of nutrients will correspond with plant uptake, soil properties and weather conditions. For more information on nutrient balance management see Draft EIS Section 3.5.3, and Draft EIS Appendix D.

The effluent storage ponds are sized to accommodate 30 days of storage for up to 2,000 mature dairy cows, and over 85 days of storage for 699 mature dairy cows. It will be highly unlikely that the storage pond will be full at any time for the contemplated 2,000-cow dairy, and nearly impossible for the committed 699-cow dairy. Throughout the less than 30-day storage period, effluent is planned for application every four days, and the slurry application is expected at least once every 45 days, to ensure that the ponds are kept at manageable levels.

Cows lactate milk following the birth of calves. Newborn calves will be housed on the Māhāʻulepū site and provided essential colostrum and nutrients for a healthy start. During the calves' initial 90 days, they will be transitioned to pasture at HDF before transfer to ranches on Kauaʻi to be raised off-site. The committed herd size of

699 mature dairy cows at the Māhāʻulepū site applies to mature mature dairy cows. Animals in various stages of lactation and rest will be transferred between HDF and other partner ranches as needed for animal health and dairy productivity. This will benefit both the dairy and infuse the beef market in Hawaiʻi with a new, local source of pasture-raised calves. Male calves will become part of the beef cattle herd; heifers (young female calves that haven't given birth) will be raised until ready to return to the HDF herd as a birthing/mature dairy cow. For more information on off-site herd management, refer to Section 3.7 of the Draft EIS.

Health of the herd is of primary importance as the success of a dairy relies on cows effectively producing quality milk. All cows will be treated with a high standard of care. Dairy managers and caretakers will be trained and competent in handling animals to minimize stress and ensure the herds' welfare. A licensed veterinarian may prescribe use of antibiotics approved by the Food & Drug Administration (FDA) for treatment of illnesses. Adherence to guidelines that prohibit milk from cows undergoing antibiotic treatment will ensure no adulteration of milk. Routine laboratory tests of milk for traces of antibiotic residue will be conducted. HDF will not inject cows with bovine growth hormone, referred to as rBST or rBGH.

SOILS: Soil is an ecosystem that can be managed to provide nutrients for plant growth, to absorb and hold rainwater for use during dryer periods, to filter and buffer potential pollutants from leaving fields, to serve as a firm foundation for agricultural activities, and to provide habitat for soil microbes to flourish and diversify to keep the ecosystem healthy. Two rounds of independent soil sampling were undertaken at HDF to understand and characterize available soil nutrients and conditions. Section 4.3 of the Environmental Impact Statement (EIS) characterizes soil conditions, and anticipated impacts from effluent and supplemental nutrient application. Recommendations from Dr. Russell Yost and Nicholas Krueger of the University of Hawaiʻi at Mānoa are summarized. Their baseline nutrient report is included as Appendix C of the Draft EIS.

Soil conservation is a core principal behind establishment of the NRCS, which was formed out of the Soil Conservation Service to acknowledge its expanded role in watershed-scale approach using science-based tools and standards in agronomy, engineering economics, wildlife biology and other disciplines to aid landowners in implementation of conservation practices. NRCS conservation practices are listed in Chapter 3, Section 3.2; these practices codes identify design and construction standards related to drainage, materials, operations and applicable engineering standards. HDF will follow the developed Conservation Plan, which was approved by the West Kauaʻi Soil & Water Conservation District in December, 2013.

The United States Department of Agriculture (USDA) Natural Resources Conservation Services (NRCS) has mapped and classified soils for more than 95 percent of the United States. Comments received during the initial scoping for this EIS included a "Custom Soils Resource Report for Island of Kauaʻi, Hawaiʻi." The report was generated from the USDA NRCS website, which allows any internet user to define an area of interest, customize data results, and generate a Custom Soil Resource Report. The user can select or deselect parameters based upon which data

the user would like to display. These user-generated reports are not evaluated by NRCS.

The NRCS soils classifications and descriptions provide a good information base, however, in-field soils testing is needed to identify existing soil nutrient levels and conditions. The most abundant soil types at the HDF site are Kalihi Clay at 32 percent, Kaʻena Clay Brown Variant at 29 percent, and Lualualei Clay at roughly 14 percent of the dairy site. Laboratory analysis of soil samples collected in 2014 identified levels of pH, phosphorus, nitrogen, potassium, calcium, magnesium, organic matter, salinity, micronutrients and other constituents. The results illustrate that the soils are depleted of nutrients, which is typical for lands formerly used for sugarcane. The soil nutrient status and fertility demands of the primary crop, Kikuyu grass, were used to identify the quantities of nutrients required for productive grass growth. The soils data provide a baseline to guide adaptive nutrient management throughout establishment and maturity of the dairy.

A second round of field sampling was conducted in 2015, and focused on evaluation of soils characterized as "poorly drained", and established a quantitative baseline of soil salinity and sodicity to provide for future monitoring of soil health with application of manure effluent. Laboratory analysis determined electrical conductivity and exchangeable sodium percentage, in addition to nutrient levels of nitrogen phosphorus calcium, magnesium, and potassium.

Poorly drained is not an indication of low or poor infiltration. Infiltration refers to the ability of water to enter the soil surface, whereas "drainage" refers to the movement of water within or from the soil profile. Poorly drained soils typically have low hydraulic conductivity, or a slow rate of groundwater movement through the soil. This slow movement can create anaerobic conditions, which typically result in higher rates of denitrification. This is the conversion of potentially nitrates and nitrites to gaseous forms, which reduces the potential for impacts on waterbodies. In this way, "poorly drained" soils may represent less risk of nitrate and nitrite leaching to associated waterbodies than "well drained" soils (Yost, 2016).

As a result of reduced movement of water through the soil profile, the mobility of nutrients such as potassium and phosphorus is also reduced. Soil types at the HDF site are known to adsorb and retain large amounts of phosphorus. Under the NRCS phosphorus leaching index for Hawaiʻi soils, HDF soils show low risk for leaching. With low risk, phosphorus can be applied at rates greater than crop requirements if manure or other organic materials are used to supply nutrients.

The dairy's focus on robust and healthy grass growth will build organic matter in soils through use of manure as a natural fertilizer. Soil can incorporate carbon from the atmosphere, which benefits soil health. According to recent studies in the Soil Science Society of America Journal, the conversion of formerly tilled cropland to grazed pasture can drive substantial accumulation of organic carbons in soil, with a potential to offset up to one-third of the annual increase in atmospheric carbon dioxide. The potential soil organic matter and carbon dioxide sequestration benefits are likely greatest in highly degraded soils in warm subtropical climates, partly due

to long pasture-growing seasons. Long-term soil impacts are anticipated to result in improvement to the physical, chemical, and biological condition of the soil.

ARCHAEOLOGICAL AND CULTURAL: The Hawai'i Dairy Farms (HDF) project is subject to a historic preservation review by the State Department of Land and Natural Resources, State Historic Preservation Division (SHPD) under HRS Chapter 6E and Chapter 13-284. An Archaeological Inventory Survey (AIS) and a Cultural Impact Assessment (CIA) were conducted by Scientific Consultant Services (SCS) for the proposed project. EIS Sections 4.7 and 4.8 provide an evaluation of archaeology and cultural resources, with technical studies in Appendix G and H.

A total of sixteen historic properties were identified through a pedestrian survey of the project area and an extended survey area of 100 meters of the northern boundary. Six historic-era sites occur in the project area and 10 sites occur in the extended survey area. Only one of the sites is believed to be associated with pre-Contact and/or early historic times. State Site 50-30-10-2250, the agricultural heiau, and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area. The remaining sites consist of historic-era bridges, ditches, culverts, retaining walls, and a flume system dating from the 20th century and are affiliated with sugarcane cultivation.

That a majority of the documented sites are related to the historic-era is not surprising, given the massive landscape modifications that occurred during intensive sugarcane cultivation on the valley floor. Even historic era cultural materials associated with the many Land Commission Awards in the project area were non-existent, as explored through survey and subsurface exploration.

The sixteen historic properties have been assessed for significance by the archaeological consultant and the dairy project is anticipated to have no impact on these sites. No further archaeological work is recommended for the sites. Two of the sixteen sites are considered significant under multiple criteria, but occur outside the project area on lands owned by a different landowner. Both sites will not be adversely affected by the proposed dairy project. No site is related to burials, and no bonex were found. Such sites have been reported along coastal areas in sand dunes.

The cultural assessment examined the potential effect of the project on cultural resources, practices or beliefs, its potential to isolate cultural resources, practices or beliefs from their setting, and the potential of the project to introduce elements which may alter the setting in which cultural practices take place. Information received from the community indicates the Māhā'ulepū Ahupua'a, has been and is currently used for traditional cultural purposes. However, the dairy project area has not been included in these activities. It is clear that the gathered plants, trails, State Site 50-30-10-2250, the agricultural heiau, and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area.

The project will be fully enclosed by perimeter fencing along the boundary of the leased premises, which will ensure that project activities and any related impacts are contained within the project area. Based on the research and comments received from the community, it is reasonable to conclude that, pursuant to Act 50, the

exercise of native Hawaiian rights or any ethnic group related to numerous traditional cultural practices will not be impacted by establishment of the dairy.

FLORA AND FAUNA: Botanical, avian, and mammalian surveys of the property were conducted for the Draft Environmental Impact Statement (EIS) to assess existing species on site, including identifying any species listed as endangered, threatened, or proposed under any state or federal endangered species programs in or near the property. EIS Sections 4.9 and 4.10 address the evaluation of flora and fauna resources, with technical studies in Appendix A and B.

A botanical survey of the dairy property was conducted in August 2014 by AECOS Consulting to assess existing plant species. The survey also investigated for the presence of plants currently listed as endangered, threatened or proposed for listing under Federal or the State of Hawai'i's endangered species programs, located onsite or within the immediate vicinity of the dairy site. The nature of the land and its present and historical uses for intensive agriculture very much limit the natural botanical resources anticipated to occur on this land. Complete species lists are included in the EIS, and no protected botanical species occur on the project property. The project will include vegetated buffer strips along the drainage ways as part of the Conservation Plan to reduce erosion and stabilize slopes. Where native plants occur or could survive if planted, native plants will be used in the stabilization. No long-term impacts to native plant habitats or endangered or threatened plants species will occur as a result of the dairy.

Avian and mammalian surveys were conducted in August 2014 by Rana Biological Consulting, Inc. This survey was conducted to assess the potential presence of avian or mammalian species currently listed as endangered, threatened or proposed for listing under either Federal or the State endangered species lists. The survey covered the dairy site area and immediate vicinity. Common birds and terrestrial mammals were encountered on the property. There is no critical habitat for endangered species in the upper Māhā'ulepū Valley.

Four species of endangered waterbirds were recorded on the site and at the nearby taro farm located within the HDF site. Though the area does not provide critical habitat, seabirds that nest in upland areas of Kauai may overfly the site. The endangered Hawaiian goose, nēnē was also seen on the site. State Division of Forestry and Wildlife biologists have noted nēnē are regularly seen on the subject property. It is probable that some nest on or adjacent to the site as this species nests in the general Kōloa area, and the habitat present on parts of the site is suitable for nēnē nesting.

The principal potential impacts posed to the five endangered species include those potentially associated with construction activities, and those associated with dairy farm operations following build-out. Measures will be adopted to avoid potential seabird and nēnē goose collisions with fences and structures. Potential measures include lowering construction cranes at night, using conservation fencing to project-specified areas, marking tall structures and fencing with white visibility polytape, limiting nighttime lighting, and shading any outside lights used at night. Ongoing mitigation strategies will be implemented for day-to-day preventative measures,

including an Avian Species Protection Plan. Mitigation measures are further described in DEIS Section 4.10.2.

It is also likely that Hawaiian hoary bats overfly the project area on a seasonal basis. While caution will be taken during any potential disturbance or vegetation removal, there are almost no suitable roost trees within the dairy site, thus it is expected that the dairy farm will not affect this listed mammalian species.

INVERTEBRATE SPECIES: A study of invertebrate species and pest insects was conducted by Steven Lee Montgomery, PhD, Consulting Biologist. The study summarizes the presence or absence of native species or pest species associated with cattle manure in the general Māhāʻulepū area, as well as the parasites and predators on site that control those species. Fieldwork was conducted during September 15-16, 2014. The entire study is included in Draft Environmental Impact Statement (EIS) as Appendix B.

CAVE AND LAVA TUBE INVERTEBRATES

There are no known caves or lava tubes found at or adjacent to the dairy farm property. The Kōloa Lava Tube System, which provides habitat for two endemic cave species, the Kauaʻi Cave Wolf Spider and the Kauaʻi Cave amphipod, is located several miles away from the dairy farm property. Both invertebrates are listed as endangered under the U.S. Endangered Species Act. Not all caves in the Kōloa area contain these invertebrates, as many do not contain the optimal climatological conditions required by these organisms. Neither the botanical and faunal survey nor the invertebrate survey revealed any evidence of lava tubes or caves on the property, and no such features have been reported for the area near the Hawaiʻi Dairy Farms (HDF) site. Thus no cave invertebrate species will be affected by the dairy farm.

INTRODUCED PREDATOR INSECTS

An invertebrate study of manure-associated insects was conducted for the Draft EIS. The study included a field survey that used manure from an adjacent beef cattle herd as a lure, and determined flies and other manure-related insects currently present at the HDF site. Pest insects such as flies can negatively impact livestock health and production, and are therefore actively managed to prevent stress and loss of productivity at dairy operations.

At the HDF site, two common flies were identified: the stable fly and the horn fly. Both of these flies are widespread throughout the Hawaiian Islands. The greenbottle fly was reared from manure taken back to a laboratory following the field survey. Additionally, flies known to exist on Kauaʻi but not seen at the HDF site during the survey were identified and include the house fly, the dog dung fly, and the chicken dung fly. These pests are common in areas with high pet populations.

In response to cattle-related insect pests, numerous species known to compete with the pests were introduced to Hawaiʻi between 1898 and 1982. Twenty species of predators and competitors to the horn fly were successfully established during that

period. Cattle egrets break up dung patties while searching for prey, and were introduced to Hawaiʻi in the late 1950s to control cattle-associated insects. Extensive introduction of dung beetle species resulted in 14 dung beetle species becoming established on Kauaʻi.

A healthy population of dung beetles can bury a dung pat in one to three days, which disrupts reproduction of flies such as the stable fly and horn fly. The stable fly requires approximately 21 days within the dung patty for the immature life stage (egg to pupa) to survive; the horn fly takes 10 to 20 days from egg to adult. Incorporation of the manure into the soil profile by dung beetles removes the habitat these flies require to complete their lifecycle. Research shows that 95 percent fewer horn flies emerged from dung patties containing a dung beetle species that has been identified at the HDF site. Proven control methods for the stable fly include parasitic micro-wasps and spreading out manure.

Among the invertebrates previously introduced to Hawaiʻi to combat livestock-related flies are extremely tiny parasitic wasps that prey on various fly species. The adult wasps could be described as the size of gnat. Using an ovipositor – described by lay people as a "stinger" – the female lays eggs in the larvae or pupa of flies. The male wasp has no such "stinger". See Draft EIS Section 4.11 for a photo providing scale for these tiny, non-stinging wasps.

To minimize potential establishment of pest flies or other insects, food waste generated during the construction phase will be bagged, covered, contained and disposed of in order to limit possible breeding habitat for flies. Inspections of building materials for ants or other insects will be conducted to prevent introduction of new pests to the HDF site. Short-term controls, including mechanical methods (e.g. sticky tapes or ribbons in the milking parlor, or traps with or without attractants) and chemical methods may be used to prevent short-term spikes in pest populations.

Insecticides and herbicides are non-discriminatory and kill beneficial as well as pest insects. Beneficial insects include primary decomposers such as earthworms and dung beetles, and pollinators including bees. Should chemical control be needed for short-term spikes in pest populations, application would be by those qualified, and in accordance with regulatory labeling requirements. HDF will implement long-term integrated pest management, which utilizes knowledge of the ancient food web among species by disrupting the manure habitat required to complete the fly life cycle. HDF and other ranchers on Kauaʻi may choose to engage with the State Department of Agriculture to translocation dung beetle species already introduced on Kauaʻi to Māhāʻulepū and other areas where manure-related flies may be a problem.

IMPACT OF SPRAYS ON BEES

Beneficial insects include primary decomposers such as earthworms and dung beetles, and pollinators including bees. Honey bees are an essential part of any agricultural ecosystem, and were observed on site during the invertebrate species

survey. Pesticides and herbicides can reduce populations of beneficial insects, which is why HDF will utilize an integrated pest management approach.

It is expected that honey bees will visit water sources set up for the HDF herd. Preventative measures will be built into any open water source to prevent bees from being trapped, and HDF will contact local beekeepers for advice regarding any bees or bee colonies encountered on site. Safe application practices for any unavoidable herbicide or pesticide will be utilized in order to narrowly target the correct pest species without harming other insects and animals in the area. Anyone using herbicides or pesticides will be properly trained and informed, and if a honey bee colony location appears to be a danger to workers or cattle, or to be in danger itself, a local beekeeper will be contacted for advice and removal.

PESTS: A study of invertebrate species and pest insects was conducted by Steven Lee Montgomery, PhD, Consulting Biologist in January 2016. The study summarizes the presence or absence of native species or pest species associated with cattle manure in the general Māhāʻulepū area, as well as the parasites and predators that control those species. No federally or state listed endangered or threatened invertebrate species were noted in the survey of the site. A full report and list of species found on site is provided in EIS Section 4.11 and Appendix B.

Flies were identified on the HDF site using manure from neighboring livestock as bait for invertebrates. The two flies associated with livestock are the stable fly and the horn fly, the latter known for biting cattle. These flies and the greenbottle fly are often confused with the house fly. Flies known to exist on Kauaʻi but not seen at the HDF site include the house fly, the dog dung fly, and the chicken dung fly. These pests are common in areas with high pet populations. It is possible these fly species could inadvertently be brought to the dairy and utilize manure as a food source. HDF will prevent and control fly population growth through diligent clean up and sanitation practices regarding any trash and food waste, as well as through efficient manure composting practices. A full list of site management measures is provided in EIS Section 4.11. The project location does not provide any habitat for *drosophila musaphilia*, the only Kauaʻi species of native Hawaiian fly listed as Endangered or Threatened. Native Drosophila habitat is located many miles away in the high elevation koa-ʻōhiʻa forests.

Fly populations at HDF will be minimized through a process known as Integrated Pest Management (IPM). Essentially, IPM disrupts reproduction with appropriate means at key points in the pest's life cycle. Used in Hawaiʻi for decades, a number of invertebrates and a bird (the cattle egret) were introduced between 1898 and 1950 to reduce livestock-related insects. IPM utilizes knowledge of the ancient food web among species.

An especially important insect to minimize fly breeding habitat in manure is the dung beetle, which buries manure and incorporates it into the soil. Populations of dung beetles found on Kauaʻi and those species already in Māhāʻulepū Valley, will increase with the increased manure food source, thus increasing and speeding breakdown of manure. Dung beetles are specialists in the very important natural process of breaking up and quickly recycling bovine manure pads. The behavioral diversity

among dung beetle species will work together to bury dung pats in one to three days, a shorter amount of time than the 10-30 days flies eggs need to hatch.

In the Kōloa-Poʻipū region, pest fly populations are dependent upon food and breeding sources nearby such as dog, cat, and chicken feces. Beef cattle graze in the region on agricultural lands along Ala Kinoiki Road between Kōloa and Poʻipū, and it is likely the livestock-related flies identified at the HDF site occur in this region as well. Localized controls to reduce pest populations need to address breeding sites in and amongst the food and animals wastes within the area. These mitigation measures will make it difficult for flies to breed, and BMPs will be enforced to address any increase in population, therefore it is expected that the dairy farm will not significantly affect recreational and resort areas.

NOISE: Existing noise conditions of the project site and the surrounding Māhāʻulepū valley area are evaluated in the Draft Environmental Impact Statement (EIS), along with anticipated short-term and long-term noise conditions associated with the dairy farm and planned mitigation actions. Draft EIS Section 4.12 addresses noise conditions.

Noise can be defined as unwanted sound, a sound that is considered loud or unpleasant, and/or sound that causes disturbance. Research related to noise and livestock focuses on noise levels and minimization of unexpected sounds that cause undue stress on cows. Noise stress results in loss of livestock productivity and thereby financial loss to farmers and ranchers. Little research exists on the sound levels from livestock.

Sound is measured in decibels (dB). The State of Hawaiʻi Department of Health (DOH) rules use the A-weighting sound network (dBA) in the HAR §11-46, Community Noise Control. Sound through the air is similar to ripples on a pond of water. In open space without reflection, ripples spread uniformly in all directions and decrease in amplitude further from the source. In free field conditions such as outdoors, amplitude drops by half as distance doubles (OSHA, 2016). When sound passes close to absorbing ground cover such as grassland and fields, the "soft ground" absorbs extra sound as it passes. The Hawaiʻi Dairy Farms (HDF) site in Māhāʻulepū Valley is approximately 2 miles from the resort area, and 1.5 miles from the closest residential areas (on land zoned for agriculture). Typical noise currently generated near the HDF site includes truck ingress/egress along private farm roads, agricultural equipment, and cattle and sheep.

Construction work at the project site will involve activities that may generate an increase in noise levels. However, such exposures will be a short-term condition, occurring during daylight hours. Construction vehicles and activities must comply with DOH Administrative Rules. DOH noise control regulation requires a permit for construction activities that emit noise in excess of 78 decibels or that cost a total of more than $250,000. Mitigation measures to minimize construction noise will include the use of mufflers to suppress loud equipment and limitations on the hours of heavy equipment operation.

The dairy farm will utilize milking equipment contained in the milking parlor, and will use field equipment such as tractors. Under HAR §11-46, agriculture is classified as Zoning District Class C, which specifies maximum permissible sound levels of 70 dBA in the daytime and 70 dBA at nighttime. Dairy operations will generate noise in keeping with agricultural zoning of the parcel. The primary noise receptors in the area would be farmers working nearby parcels. Noise from the dairy will not exceed the DOH threshold, and will not contribute to excessive noise in the region.

DEMOGRAPHIC AND ECONOMIC: The potential impacts of Hawai'i Dairy Farms (HDF) to the existing economy were evaluated in the Draft Environmental Impact Statement (EIS), including a fiscal impact assessment report completed in April, 2016 by Plasch Economics Pacific. Draft EIS Section 4.15 addresses demographic and economic factors, with the complete report in Appendix J.

The HDF project would create short-term benefits through jobs for local construction personnel and local material suppliers. Such jobs would include equipment operators, cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, supervisors, painters, etc. Based on State employment multipliers, indirect employment related to Dairy construction would be expected to average about 16 jobs on Kaua'i, and 8 on O'ahu. Construction employment would be expected to average about 12 jobs per year during the development period. Thus direct-plus-indirect employment association with construction would be expected to average approximately 36 jobs, of which 28 would be on Kaua'i.

The HDF project would contribute to diversification of Kaua'i's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Hawai'i Island), approximately10 percent of Hawai'i's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and indirect full-time equivalent jobs on Kaua'i, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on O'ahu.

HDF is expected to generate a net income of approximately $68,000 to the County when the 699 cow herd is established. When the dairy has matured to full production for the 699 cow dairy, net income to the State is calculated at $160,000 annually. With the potential contemplated herd size of up to 2,000 mature dairy cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be produced. This would double local milk production currently supplied by operational dairies on the Island of Hawai'i.

Additional employment generated by a possible expansion to accommodate the contemplated 2,000 mature dairy cow herd is estimated at approximately 3 construction jobs plus 4 indirect jobs on Kaua'i, and 2 indirect jobs on O'ahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an

additional 5 full-time farm jobs would be added, with approximately 15 additional indirect jobs on Kaua'i and another 8 indirect jobs on O'ahu.

The dairy is expected to generate a net additional contribution to the County of approximately $8,000 for improvements related to expansion for the contemplated herd size of up to 2,000 mature dairy cows ($76,000 total versus $68,000 for the committed herd size). The State will derive approximately $360,000 annually in revenues from the contemplated 2,000-mature dairy cow dairy.

Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhā'ulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhā'ulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Po'ipū region is on the order of 201 – 500 feet per day.

Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhāʻulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawaiʻi Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhāʻulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhāʻulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhāʻulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kauaʻi community.

Regional Water Demand: The adjacent, developed Kōloa-Poʻipū region shows large and increasing demand for potable water for community and resort development.

The State Department of Economic Development and Tourism (DBEDT) projects the population of Kauaʻi will increase county-wide by 17,300 residents by 2030. The South Kauaʻi population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kauaʻi region (the Kōloa - Poʻipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhāʻulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhāʻulepū watershed.

The HDF site is located on the bottom-land of the upper Māhāʻulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Haʻupu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhāʻulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kauaʻi Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhāʻulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhāʻulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhāʻulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the

current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Poʻipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality

monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kaua'i community.

AIR QUALITY: As a part of the Environmental Impact Statement (EIS), existing air quality conditions and project impacts were evaluated, including dust and odor. Potential odors and emission levels for air pollutants relevant to dairy operations were modeled, as currently there are no cows on site. EIS sections 4.19 and 4.25 provide an evaluation of air quality and odors, including a windrose depicting wind speed and direction in the area (see DEIS Section 4.1, Climate). The full air quality technical report can be found in Draft EIS Appendix I.

Clean Air Act

Under the *Clean Air Act of 1970* (CAA), amended November 1990, the U.S. Environmental Protection Agency (EPA) regulates both large and small sources of air pollutants by establishing National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. The State of Hawai'i has established its own *State Ambient Air Quality Standards* (SAAQS) that are as strict or, in some cases more strict than the NAAQS. State standards prohibit any visible emissions of fugitive dust from construction activities at the property line.

Emissions relevant to livestock operation include particulate matter and fugitive dust. Greenhouse gases related to dairy cows include methane (CH_4) from enteric fermentation, and both methane and nitrous oxide (N_20) emissions from manure application. No State or Federal regulations for greenhouse gas emissions from farm operations or small businesses currently exist.

DUST

Dust will be generated as cows move along soft limestone walkways that connect the paddocks and lead to and from the milking parlor. Potential fugitive dust emission rates were estimated from published literature, where particulate matter (PM) is measurable from the "drylots" of confined dairy operations where animals walk over dirt and dried manure throughout the day.

Applying the emission rates from this available literature greatly overestimates potential emission resulting from HDF. Cows in the pastoral rotational-grazing system will be on pasture 22 hours each day and will spend two hours – in two separate milking cycles –moving to and from the barn for the 10- to 15-minute milking sessions.

Using atmospheric dispersion modeling system (AERMOD), the rates were scaled to the size of the non-pasture areas used by cows at HDF. Results were added to the background concentration of particulate matter (both PM_{10} and $PM_{2.5}$) measured on the island of Kaua'i, and the total concentration was compared to the State ambient

air quality standards. Only the contemplated herd size of up to 2,000 mature dairy cows was modeled, as at the lower threshold of 699 cows, the potential fugitive dust impact would be negligible. The estimated concentration for PM_{10} is 2.01 $\mu g/m^3$, well below the State standard of 150 $\mu g/m^3$. The estimated concentration for $PM_{2.5}$ is 0.23 $\mu g/m^3$, well below the Federal standard of 35 $\mu g/m^3$ (see Draft EIS Section 4.19 and Table 4-19.2).

ODOR

Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF, so air dispersion models were used to determine potential odor levels. Local weather data was used in conjunction with the AERMOD modeling system, and published rates for manure odors emissions for dairy heifers and effluent ponds were adapted to reflect the HDF facilities.

Odor emission sources identified for modeling at HDF were manure in the pasture fields, irrigation water containing diluted nutrients from effluent, the effluent storage ponds, and the dairy buildings. Odor rates from published research were applied. Odor isopleths (a line used to map all points having the same numerical value) were created to display the model findings. Odor is described in "odor units" at the threshold of perception, which is defined by the point at which 50 percent of panelists, in laboratory conditions, cannot smell the odor but 50 percent of the panelists can detect the odor.

Modeling results were generated for worst case meteorological conditions (low wind velocity / mixing). Generally, tradewinds will disperse odors to less than detectable levels beyond the HDF site; in periods of no wind, odor may not be dispersed creating the "worst case" scenario. In these periods without normal tradewind flow, the odor plume would extend to the south of the HDF site. Sections 4.19.2 and 4.25.2 of the EIS include graphics of the potential odor isopleths.

Results for the committed herd size of 699 mature dairy cows show that odors may be detectable by 50 percent of the sensitive population once per 200 hours, or 44 hours per year, within an area that extends approximately 1,670-feet (within one-third of a mile) beyond the dairy farm boundary, and does not reach recreational or residential areas. Results for the contemplated expanded herd size of up to 2,000 mature dairy cows show odors would not extend beyond 2,780 feet outside the HDF boundary (just over half a mile), again not reaching recreational or residential areas, and again with detection limited to 50 percent of the sensitive population approximately 44 hours per year. The parameters used in the analysis were intentionally conservative, and the impacts shown assume an unlikely confluence of worst-case meteorological data, irrigation location, and grazing location. Actual offsite odor impacts are likely to be much lower and/or less frequent than shown; it is likely odor detection beyond the HDF boundaries will be less frequent.

GREENHOUSE GASSES: Draft Environmental Impact Statement (EIS) Sections 4.19 and 4.26 address the potential for greenhouse gas emissions by Hawai'i Dairy Farms (HDF). Estimates of GHG emission rates from a pasture-based dairy, including

methane and nitrous oxide, were calculated using the 2006 Intergovernmental Panel on Climate Change (IPCC) Guidelines for National Greenhouse Gas Inventories. Parameters for Oceanic dairy cattle in warm climates were selected as most applicable to conditions at HDF. Long-term operational impacts were modeled using the IPCC guidelines and conversions, and estimated the emissions potential for GHG at the dairy at the committed herd size of 699 milking cows to be 2,693 CO_2e metric tons per year. This equates to roughly 1.02 percent of the utility power generation sector on Kaua'i in 2013, which does not include vehicle emissions and other GHG emitters on the island.

Potential GHG emissions for HDF at the contemplated herd size of up to 2,000 milking cows was modeled as described in Section 4.19.3 using the IPCC guidelines and conversions. The estimated total of 7,702 CO_2e metric tons per year (8,490 tons) is 5,009 CO_2e metric tons (5,521 tons) greater than the committed herd size of 699 milking cows. This equates to an increase equivalent to 1.91 percent of GHG produced on Kaua'i for power generation by the utility in 2013 (KIUC, 2014). Power generation does not include vehicle emissions and other GHG emitters on the island.

While the presence of cows may increase GHG, a long-term beneficial impact of the grazing fields is the sequestration of carbon as CO_2 captured by the process of photosynthesis by the grass. According to recent studies in the Soil Science Society of America Journal, converting formerly tilled cropland to grazed pasture can drive substantial accumulation of organic carbons in soil, which enhances soil quality, grass production, and has the potential to offset up to one-third the annual increase in CO_2 production of an area.

ALTERNATIVES: As a part of the DEIS, alternatives were evaluated that could attain the objectives of the action's purpose and need, and were compared with environmental benefits, costs, and risks of each reasonable alternative against those of the proposed dairy project. Further discussion of alternatives can be found in DEIS Section 6.

The DEIS evaluates alternatives that could attain the objectives of the action's purpose and need, and compares environmental benefits, costs, and risks of each reasonable alternative against those of the proposed action. Additionally, reasonable land use alternatives that emerged from public input during the project scoping phase are documented and briefly discussed. The alternatives that do not meet the project purpose are not advanced for analysis of environmental benefits, costs, and risks. The Environmental Impact Statement Rules, Hawai'i Administrative Rules Chapter 11-200 (HRS 11-200) requires a discussion of alternatives that could attain the objectives of the action, regardless of cost. There is no requirement for the alternatives analysis to consider every possible land use.

Four possible land uses that would not meet the project purpose are discussed. Rezoning the land for resort or residential development, or a potential conservation condemnation are two uses that were examined and eliminated from analysis. These options would not be reasonably viable given the existing private land tenure and existing zoning. Two additional alternatives were considered as reasonable land uses as they could be permitted within the existing State Land Use Agricultural

District and County Agricultural Zoning District. These options include Agricultural Park with Processing Center, and development of an Agricultural Subdivision. The alternatives were examined and eliminated from further analysis, however, as they would not fulfill the project purpose.

The analysis, therefore, focuses on alternatives that meet the project purpose. Rigorous exploration and evaluation of the environmental impacts of the alternatives, including those that might enhance environmental quality or avoid, reduce or minimize some or all of the adverse environmental effects, costs and risks. These alternatives include: (1) the development of a Conventional Feedlot Dairy (a non-pasture-based dairy) at the same location, and (2) development of the Pasture-Based Dairy at an Alternative Location on Kaua'i. The alternative of "No Action" is also evaluated. One additional alternative, considering a scenario for the Dairy Products at an Off-Island Facility, was evaluated.

Although the alternative approaches are potentially reasonable uses under existing zoning and neighboring uses, they each fail to comprehensively fulfill the requirements defined with the five established Evaluation Criteria (I-V). The essential differences as compared to the proposed action are highlighted in the following statements.

- Only one of the alternative actions (conventional feedlot alternative) would create a commercial scale dairy operation in Hawai'i, with the capability to produce 10 percent of the State's fresh milk demand, reducing dependence on imported milk (Criterion I). This alternative, however, would not be pasture-based and could negatively affect air and water quality.
- None of the alternatives would include a dairy location that meets the requirements of a pastoral, rotational-grazing dairy minimum land area, soil properties, slope conditions, water supply, land tenure and availability, and accessibility (Criterion 1).
- One alternative (Agricultural Park) could potentially generate new long-term employment in the agricultural sector on Kaua'i in a wide range of positions including pasture agronomy/soils science, livestock management, environmental resources management (Criterion 2). However, the purpose and need to provide fresh fluid milk would only be met with the Conventional Feedlot Dairy Alternative.
- The alternative for Agricultural Park could also develop sustainable food production utilizing Important Agricultural Lands, demonstrating the importance of long term agricultural leases and capital investment for agricultural infrastructure, water systems and support facilities. (Criterion 3). After many years, Grove Farm encountered limited interest in such a venture.
- Finally, addressing the range of potential environmental impacts (natural, cultural, social and economic) (Criterion 5) the four alternative scenarios would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.

In contrast, the planned agricultural operations of Hawai'i Dairy Farm, were determined after substantial analysis to be the most viable option and is the

preferred alternative. Of all the alternatives considered, this is the only approach that achieves project objectives and meets each of the five Evaluation Criteria (Section 2.3.4):

Hawai'i Dairy Farms will create a commercial scale pasture-based dairy operation in Hawai'i, with the capability to provide more than 1,000,000 gallons of the fresh milk demand, reducing dependence on imported milk (Objective 1).

- The planned dairy location that meets the requirements of minimum land area, soil properties, slope conditions, water supply, land tenure and availability, and accessibility (Criterion 1).
- The planned action will generate new long-term employment in the agricultural sector on Kaua'i, including pasture agronomy/soils science, livestock management, veterinary and animal husbandry, environmental resources management, milk/milk processing, and dairy business management (Criterion 2).
- Sustainable food production utilizing Important Agricultural Lands (Criterion 3) will occur with the proposed action, demonstrating the importance of long term agricultural leases, and the ability to draw capital investment for agricultural infrastructure including water systems and support facilities (Criterion 3).
- Address the range of potential environmental impacts by utilizing 100% of manure as natural fertilizer to grow the majority of food for cows (Criterion 4). The alternatives evaluated would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.
- Creating an economically viable pasture rotational-grazing model maintains agriculture, retains open space, and provides buffer between highly utilized resort and residential development and sensitive natural or cultural resources (Criterion 5).

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

Feb. 21, 2015

State of Hawai'i

Department of Health

1250 Punchbowl Street

Honolulu, HI 96813.

Re: EIS/Hawaii Dairy Farm

Dear Ms. Laura McIntyre,

I am shocked the Hawaii Dairy Farm idea has progressed to this point. I have investment property in Poipu Kai and will be selling out soon if this Farm continues to gain momentum. This Farm would have substantial affects on the economic and social welfare of the community in Poipu. But that is just the tourist industry affects. The impact of the Dairy Farm on the environment, water quality, air quality, and most likely the public health would be tremendous. These concerns need to be addressed and answered by the EIS. I trust that the State of Hawaii will ensure the EIS is thorough, comprehensive, and honest. And I hope the Hawaii Dairy Farm relocates to another area more suited to that activity.

Sincerely

Judith E. Brendel

Judith E. Brendel

3221 Creekside Dr

Anchorage, AK 99504

May 26, 2016

Judith E. Brendel
3221 Creekside Drive
Anchorage, AK 99504

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Judith E. Brendel:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

Your comments were received by the State of Hawai'i Department of Health Environmental Planning office. The Department of Health forwarded a copy of your comments to Group 70 International in order to be included in the Draft Environmental Impact Statement (EIS) analysis. This letter was prepared in response to your comments.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

DEMOGRAPHIC AND ECONOMIC: The potential impacts of Hawai'i Dairy Farms (HDF) to the existing economy were evaluated in the Draft Environmental Impact Statement (EIS), including a fiscal impact assessment report completed in April, 2016 by Plasch Economics Pacific. Draft EIS Section 4.15 addresses demographic and economic factors, with the complete report in Appendix J.

The HDF project would create short-term benefits through jobs for local construction personnel and local material suppliers. Such jobs would include equipment operators, cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, supervisors, painters, etc. Based on State employment multipliers, indirect employment related to Dairy construction would be expected to average about 16 jobs on Kaua'i, and 8 on O'ahu. Construction employment would be expected to average about 12 jobs per year during the development period. Thus direct-plus-indirect employment association with construction would be expected to average approximately 36 jobs, of which 28 would be on Kaua'i.

The HDF project would contribute to diversification of Kaua'i's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Hawai'i Island), approximately10 percent of Hawai'i's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and indirect full-time equivalent jobs on Kaua'i, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on O'ahu.

HDF is expected to generate a net income of approximately $68,000 to the County when the 699 cow herd is established. When the dairy has matured to full production for the 699 cow dairy, net income to the State is calculated at $160,000 annually. With the potential contemplated herd size of up to 2,000 mature dairy cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be produced. This would double local milk production currently supplied by operational dairies on the Island of Hawai'i.

Additional employment generated by a possible expansion to accommodate the contemplated 2,000 mature dairy cow herd is estimated at approximately 3 construction jobs plus 4 indirect jobs on Kaua'i, and 2 indirect jobs on O'ahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an additional 5 full-time farm jobs would be added, with approximately 15 additional indirect jobs on Kaua'i and another 8 indirect jobs on O'ahu.

The dairy is expected to generate a net additional contribution to the County of approximately $8,000 for improvements related to expansion for the contemplated herd size of up to 2,000 mature dairy cows ($76,000 total versus $68,000 for the committed herd size). The State will derive approximately $360,000 annually in revenues from the contemplated 2,000-mature dairy cow dairy.

Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhā'ulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhā'ulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Po'ipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhā'ulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawai'i Department of Health Milk

Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhā'ulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhā'ulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhā'ulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kaua'i community.

Regional Water Demand: The adjacent, developed Kōloa-Po'ipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kaua'i will increase county-wide by 17,300 residents by 2030. The South Kaua'i population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kaua'i region (the Kōloa - Po'ipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhā'ulepū Surface

Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhāʻulepū watershed.

The HDF site is located on the bottom-land of the upper Māhāʻulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Haʻupu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhāʻulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kauaʻi Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhāʻulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhāʻulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhāʻulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Poʻipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kauaʻi community.

AIR QUALITY: As a part of the Environmental Impact Statement (EIS), existing air quality conditions and project impacts were evaluated, including dust and odor. Potential odors and emission levels for air pollutants relevant to dairy operations were modeled, as currently there are no cows on site. EIS sections 4.19 and 4.25 provide an evaluation of air quality and odors, including a windrose depicting wind speed and direction in the area (see DEIS Section 4.1, Climate). The full air quality technical report can be found in Draft EIS Appendix I.

Clean Air Act

Under the *Clean Air Act of 1970* (CAA), amended November 1990, the U.S. Environmental Protection Agency (EPA) regulates both large and small sources of air pollutants by establishing National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. The State of Hawaiʻi has established its own *State Ambient Air Quality Standards* (SAAQS) that are as strict or, in some cases more strict than the NAAQS. State standards prohibit any visible emissions of fugitive dust from construction activities at the property line.

Emissions relevant to livestock operation include particulate matter and fugitive dust. Greenhouse gases related to dairy cows include methane (CH_4) from enteric fermentation, and both methane and nitrous oxide (N_20) emissions from manure application. No State or Federal regulations for greenhouse gas emissions from farm operations or small businesses currently exist.

DUST

Dust will be generated as cows move along soft limestone walkways that connect the paddocks and lead to and from the milking parlor. Potential fugitive dust emission rates were estimated from published literature, where particulate matter (PM) is measurable from the "drylots" of confined dairy operations where animals walk over dirt and dried manure throughout the day.

Applying the emission rates from this available literature greatly overestimates potential emission resulting from HDF. Cows in the pastoral rotational-grazing system will be on pasture 22 hours each day and will spend two hours – in two separate milking cycles –moving to and from the barn for the 10- to 15-minute milking sessions.

Using atmospheric dispersion modeling system (AERMOD), the rates were scaled to the size of the non-pasture areas used by cows at HDF. Results were added to the background concentration of particulate matter (both PM_{10} and $PM_{2.5}$) measured on the island of Kauaʻi, and the total concentration was compared to the State ambient air quality standards. Only the contemplated herd size of up to 2,000 mature dairy cows was modeled, as at the lower threshold of 699 cows, the potential fugitive dust impact would be negligible. The estimated concentration for PM_{10} is 2.01 $\mu g/m^3$, well below the State standard of 150 $\mu g/m^3$. The estimated concentration for $PM_{2.5}$ is 0.23 $\mu g/m^3$, well below the Federal standard of 35 $\mu g/m^3$ (see Draft EIS Section 4.19 and Table 4-19.2).

ODOR

Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF, so air dispersion models were used to determine potential odor levels. Local weather data was used in conjunction with the AERMOD modeling system, and published rates for manure odors emissions for dairy heifers and effluent ponds were adapted to reflect the HDF facilities.

Odor emission sources identified for modeling at HDF were manure in the pasture fields, irrigation water containing diluted nutrients from effluent, the effluent storage ponds, and the dairy buildings. Odor rates from published research were applied. Odor isopleths (a line used to map all points having the same numerical value) were created to display the model findings. Odor is described in "odor units" at the threshold of perception, which is defined by the point at which 50 percent of panelists, in laboratory conditions, cannot smell the odor but 50 percent of the panelists can detect the odor.

Modeling results were generated for worst case meteorological conditions (low wind velocity / mixing). Generally, tradewinds will disperse odors to less than detectable levels beyond the HDF site; in periods of no wind, odor may not be dispersed creating the "worst case" scenario. In these periods without normal tradewind flow, the odor plume would extend to the south of the HDF site. Sections 4.19.2 and 4.25.2 of the EIS include graphics of the potential odor isopleths.

Results for the committed herd size of 699 mature dairy cows show that odors may be detectable by 50 percent of the sensitive population once per 200 hours, or 44 hours per year, within an area that extends approximately 1,670-feet (within one-third of a mile) beyond the dairy farm boundary, and does not reach recreational or residential areas. Results for the contemplated expanded herd size of up to 2,000 mature dairy cows show odors would not extend beyond 2,780 feet outside the HDF boundary (just over half a mile), again not reaching recreational or residential areas, and again with detection limited to 50 percent of the sensitive population approximately 44 hours per year. The parameters used in the analysis were intentionally conservative, and the impacts shown assume an unlikely confluence of worst-case meteorological data, irrigation location, and grazing location. Actual offsite odor impacts are likely to be much lower and/or less frequent than shown; it is likely odor detection beyond the HDF boundaries will be less frequent.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

From: katy.britzmann@hyatt.com
To: epo@doh.hawaii.gov; HDF
Subject: COMMENTS ON HAWAI'I DAIRY FARM'S ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE, DATED JANUARY, 2015.
Date: Monday, February 23, 2015 1:31:21 PM

Aloha,
I have very serious concerns about the proposed dairy at Mahaulepu Valley on Kauai. I am glad that an EIS will be prepared and hope that it will address the many issues, environmental, social and cultural, that a dairy in this location presents. While HDF states they are voluntarily doing this process, to truly be pono, this should have been done well in advance of any infrastructure changes or the announcement that a dairy IS going in at this location, as the EIS is designed to determine whether a project like a dairy ***should*** go in by providing substantive data that indicates that it will not be environmentally, culturally or socially harmful.

NUMBERS
Beginning with the proposed herd and the recent "reduction" in herd size to 699 (a significantly chosen number as 700 cows is classified as a Large Confined Animal Feed Operation). What is not noted by HDF with this revised herd size is that those 699 cows will be shipped in pregnant, thus there will be double that number after gestation. Males will then be thinned out through outsourcing and killing of a certain amount, so that 699 would be about 900 cows on the land after gestation. Regardless of this claim of a reduced herd size, the EIS must evaluate the plan based on the proposed final herd size of 2,000.

WASTE
According to the EPA, waste estimates for dairy cattle are equivalent to 164 times the amount of humans, thus the 2,000 cows would produce waste equivalent to approximately 328,000 people, fully 5 times the population of the entire island. Microorganisms causing health risks to humans like E. Coli, enterococcus and leptospirosis are common in the feces of cattle, these organisms could likely end up in the adjacent streams leading to the ocean as well as groundwater.

SOIL
HDF should be required to do a detailed, accurate soil survey to determine once and for all if the soil is able to handle the amount of waste that will accumulate and be applied via airborne spray as fertilizer. Again, had HDF followed proper protocol and done an EIS at the outset, perhaps they would have provided more accurate information on the soil in the area in question. Their initial plan stated that soil in the area was porous volcanic, which it is not. A later NRCS survey of the soil indicates that most of it is primarily clay with "very limited" capability to handle manure load and has a high potential for runoff.

DRINKING WATER WELLS
HDF should be required to do an extensive groundwater study to assess effects of waste applied to the soil. Their current Waste Management Plan does not identify all of the nearby drinking water wells and misrepresents the distance of some of those that are identified on the map. Most significantly, one well (Koloa F) is very near to the area in which their wastewater treatment plant will apply the sludge that accumulates in the ponds.

AIRBORNE CONTAMINANTS
HDF plans to spray waste from the effluent ponds on the fields as fertilizer. These spray machines are very tall and with dominant trade winds the possibility of spray affecting homes and businesses downwind is a potential problem. The EIS should address airborne contaminants produced by the dairy and the environmental, health, and social impacts.

SOCIAL CONCERNS
The Mahaulepu area is popular for nature oriented activities and subsistence such as fishing, hiking, beach-going activities, bird watching and more. The EIS must address how these activities would be impacted by environmental effects from a large dairy of this size upstream of the beach-going area.

The Koloa/Poipu area is home to approximately 3,000 residents, all of whom will be downwind of the dairy and thus affected by any airborne contaminants or odor. The area is also one of the top 3 visitor destinations, providing significant income to both County and State through property, TAT, general excise and other taxes. Environmental air, water and vector control concerns from the dairy would reduce property values and make the area less desirable to visitors. The largest private employer for the island is within 2.5 miles of the proposed dairy and a thriving visitor industry encompasses the entire Koloa/Poipu area, a decrease in visitors to the area would adversely affect those employers thus causing loss of jobs and income for island residents. Reduced property values and visitors to the area would not only affect the local economy through loss of jobs/decreased incomes for residents, but reduced revenues for the State and County as well.

The above noted concerns should all be fully addressed by the EIS for Hawaii Dairy Farm's proposal at Mahaulepu Valley. Given the open, available, leasable land on the island, particularly that owned by lessor Grove Farm, this seems to be one of the most ill-suited locations for such an operation. Its proximity to freshwater sources, the ocean, nearby homes and businesses make this an extremely poor location for a dairy, especially given that all milk will have to be trucked to the port in Nawiliwili for shipment to Oahu for processing. The above noted environmental, health & social concerns in addition to this fact, render this a plan that will negatively impact the environment and economy of Kauai.

Mahalo for your careful consideration of my concerns and your diligence in evaluating the impacts of this project.

_____
Katy Britzmann | Director of Sales
Grand Hyatt Kauai Resort & Spa
p 808-240-6427 c 808-635-0243

GROUP 70 INTERNATIONAL

May 26, 2016

Katy Britzmann
Katy.britzmann@hyatt.com

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Katy Britzmann:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

Your comments were received by the State of Hawai'i Department of Health Environmental Planning office. The Department of Health forwarded a copy of your comments to Group 70 International in order to be included in the Draft Environmental Impact Statement (EIS) analysis. This letter was prepared in response to your comments.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

SOILS: Soil is an ecosystem that can be managed to provide nutrients for plant growth, to absorb and hold rainwater for use during dryer periods, to filter and buffer potential pollutants from leaving fields, to serve as a firm foundation for agricultural activities, and to provide habitat for soil microbes to flourish and diversify to keep the ecosystem healthy. Two rounds of independent soil sampling were undertaken at HDF to understand and characterize available soil nutrients and conditions. Section 4.3 of the Environmental Impact Statement (EIS) characterizes

soil conditions, and anticipated impacts from effluent and supplemental nutrient application. Recommendations from Dr. Russell Yost and Nicholas Krueger of the University of Hawai'i at Mānoa are summarized. Their baseline nutrient report is included as Appendix C of the Draft EIS.

Soil conservation is a core principal behind establishment of the NRCS, which was formed out of the Soil Conservation Service to acknowledge its expanded role in watershed-scale approach using science-based tools and standards in agronomy, engineering economics, wildlife biology and other disciplines to aid landowners in implementation of conservation practices. NRCS conservation practices are listed in Chapter 3, Section 3.2; these practices codes identify design and construction standards related to drainage, materials, operations and applicable engineering standards. HDF will follow the developed Conservation Plan, which was approved by the West Kaua'i Soil & Water Conservation District in December, 2013.

The United States Department of Agriculture (USDA) Natural Resources Conservation Services (NRCS) has mapped and classified soils for more than 95 percent of the United States. Comments received during the initial scoping for this EIS included a "Custom Soils Resource Report for Island of Kaua'i, Hawai'i." The report was generated from the USDA NRCS website, which allows any internet user to define an area of interest, customize data results, and generate a Custom Soil Resource Report. The user can select or deselect parameters based upon which data the user would like to display. These user-generated reports are not evaluated by NRCS.

The NRCS soils classifications and descriptions provide a good information base, however, in-field soils testing is needed to identify existing soil nutrient levels and conditions. The most abundant soil types at the HDF site are Kalihi Clay at 32 percent, Ka'ena Clay Brown Variant at 29 percent, and Lualualei Clay at roughly 14 percent of the dairy site. Laboratory analysis of soil samples collected in 2014 identified levels of pH, phosphorus, nitrogen, potassium, calcium, magnesium, organic matter, salinity, micronutrients and other constituents. The results illustrate that the soils are depleted of nutrients, which is typical for lands formerly used for sugarcane. The soil nutrient status and fertility demands of the primary crop, Kikuyu grass, were used to identify the quantities of nutrients required for productive grass growth. The soils data provide a baseline to guide adaptive nutrient management throughout establishment and maturity of the dairy.

A second round of field sampling was conducted in 2015, and focused on evaluation of soils characterized as "poorly drained", and established a quantitative baseline of soil salinity and sodicity to provide for future monitoring of soil health with application of manure effluent. Laboratory analysis determined electrical conductivity and exchangeable sodium percentage, in addition to nutrient levels of nitrogen phosphorus calcium, magnesium, and potassium.

Poorly drained is not an indication of low or poor infiltration. Infiltration refers to the ability of water to enter the soil surface, whereas "drainage" refers to the movement of water within or from the soil profile. Poorly drained soils typically

have low hydraulic conductivity, or a slow rate of groundwater movement through the soil. This slow movement can create anaerobic conditions, which typically result in higher rates of denitrification. This is the conversion of potentially nitrates and nitrites to gaseous forms, which reduces the potential for impacts on waterbodies. In this way, "poorly drained" soils may represent less risk of nitrate and nitrite leaching to associated waterbodies than "well drained" soils (Yost, 2016).

As a result of reduced movement of water through the soil profile, the mobility of nutrients such as potassium and phosphorus is also reduced. Soil types at the HDF site are known to adsorb and retain large amounts of phosphorus. Under the NRCS phosphorus leaching index for Hawai'i soils, HDF soils show low risk for leaching. With low risk, phosphorus can be applied at rates greater than crop requirements if manure or other organic materials are used to supply nutrients.

The dairy's focus on robust and healthy grass growth will build organic matter in soils through use of manure as a natural fertilizer. Soil can incorporate carbon from the atmosphere, which benefits soil health. According to recent studies in the Soil Science Society of America Journal, the conversion of formerly tilled cropland to grazed pasture can drive substantial accumulation of organic carbons in soil, with a potential to offset up to one-third of the annual increase in atmospheric carbon dioxide. The potential soil organic matter and carbon dioxide sequestration benefits are likely greatest in highly degraded soils in warm subtropical climates, partly due to long pasture-growing seasons. Long-term soil impacts are anticipated to result in improvement to the physical, chemical, and biological condition of the soil.

DEMOGRAPHIC AND ECONOMIC: The potential impacts of Hawai'i Dairy Farms (HDF) to the existing economy were evaluated in the Draft Environmental Impact Statement (EIS), including a fiscal impact assessment report completed in April, 2016 by Plasch Economics Pacific. Draft EIS Section 4.15 addresses demographic and economic factors, with the complete report in Appendix J.

The HDF project would create short-term benefits through jobs for local construction personnel and local material suppliers. Such jobs would include equipment operators, cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, supervisors, painters, etc. Based on State employment multipliers, indirect employment related to Dairy construction would be expected to average about 16 jobs on Kaua'i, and 8 on O'ahu. Construction employment would be expected to average about 12 jobs per year during the development period. Thus direct-plus-indirect employment association with construction would be expected to average approximately 36 jobs, of which 28 would be on Kaua'i.

The HDF project would contribute to diversification of Kaua'i's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Hawai'i Island), approximately10 percent of Hawai'i's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of milk annually, a 50 percent increase in statewide milk production. On-going dairy

operations at the committed herd size will provide approximately 16 direct and indirect full-time equivalent jobs on Kaua'i, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on O'ahu.

HDF is expected to generate a net income of approximately $68,000 to the County when the 699 cow herd is established. When the dairy has matured to full production for the 699 cow dairy, net income to the State is calculated at $160,000 annually. With the potential contemplated herd size of up to 2,000 mature dairy cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be produced. This would double local milk production currently supplied by operational dairies on the Island of Hawai'i.

Additional employment generated by a possible expansion to accommodate the contemplated 2,000 mature dairy cow herd is estimated at approximately 3 construction jobs plus 4 indirect jobs on Kaua'i, and 2 indirect jobs on O'ahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an additional 5 full-time farm jobs would be added, with approximately 15 additional indirect jobs on Kaua'i and another 8 indirect jobs on O'ahu.

The dairy is expected to generate a net additional contribution to the County of approximately $8,000 for improvements related to expansion for the contemplated herd size of up to 2,000 mature dairy cows ($76,000 total versus $68,000 for the committed herd size). The State will derive approximately $360,000 annually in revenues from the contemplated 2,000-mature dairy cow dairy.

Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhā'ulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain

by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhā'ulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Po'ipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhā'ulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawai'i Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhā'ulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhā'ulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhāʻulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kauaʻi community.

Regional Water Demand: The adjacent, developed Kōloa-Poʻipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kauaʻi will increase county-wide by 17,300 residents by 2030. The South Kauaʻi population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kauaʻi region (the Kōloa - Poʻipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhāʻulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhāʻulepū watershed.

The HDF site is located on the bottom-land of the upper Māhāʻulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Haʻupu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhāʻulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction

Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kauaʻi Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhāʻulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhāʻulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhāʻulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways;

only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Poʻipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal

area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kauaʻi community.

AIR QUALITY: As a part of the Environmental Impact Statement (EIS), existing air quality conditions and project impacts were evaluated, including dust and odor. Potential odors and emission levels for air pollutants relevant to dairy operations were modeled, as currently there are no cows on site. EIS sections 4.19 and 4.25 provide an evaluation of air quality and odors, including a windrose depicting wind speed and direction in the area (see DEIS Section 4.1, Climate). The full air quality technical report can be found in Draft EIS Appendix I.

Clean Air Act

Under the *Clean Air Act of 1970* (CAA), amended November 1990, the U.S. Environmental Protection Agency (EPA) regulates both large and small sources of air pollutants by establishing National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. The State of Hawaiʻi has established its own *State Ambient Air Quality Standards* (SAAQS) that are as strict or, in some cases more strict than the NAAQS. State standards prohibit any visible emissions of fugitive dust from construction activities at the property line.

Emissions relevant to livestock operation include particulate matter and fugitive dust. Greenhouse gases related to dairy cows include methane (CH_4) from enteric fermentation, and both methane and nitrous oxide (N_20) emissions from manure application. No State or Federal regulations for greenhouse gas emissions from farm operations or small businesses currently exist.

DUST

Dust will be generated as cows move along soft limestone walkways that connect the paddocks and lead to and from the milking parlor. Potential fugitive dust emission rates were estimated from published literature, where particulate matter (PM) is measurable from the "drylots" of confined dairy operations where animals walk over dirt and dried manure throughout the day.

Applying the emission rates from this available literature greatly overestimates potential emission resulting from HDF. Cows in the pastoral rotational-grazing system will be on pasture 22 hours each day and will spend two hours – in two separate milking cycles –moving to and from the barn for the 10- to 15-minute milking sessions.

Using atmospheric dispersion modeling system (AERMOD), the rates were scaled to the size of the non-pasture areas used by cows at HDF. Results were added to the background concentration of particulate matter (both PM_{10} and $PM_{2.5}$) measured on the island of Kaua'i, and the total concentration was compared to the State ambient air quality standards. Only the contemplated herd size of up to 2,000 mature dairy cows was modeled, as at the lower threshold of 699 cows, the potential fugitive dust impact would be negligible. The estimated concentration for PM_{10} is 2.01 $\mu g/m^3$, well below the State standard of 150 $\mu g/m^3$. The estimated concentration for $PM_{2.5}$ is 0.23 $\mu g/m^3$, well below the Federal standard of 35 $\mu g/m^3$ (see Draft EIS Section 4.19 and Table 4-19.2).

ODOR

Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF, so air dispersion models were used to determine potential odor levels. Local weather data was used in conjunction with the AERMOD modeling system, and published rates for manure odors emissions for dairy heifers and effluent ponds were adapted to reflect the HDF facilities.

Odor emission sources identified for modeling at HDF were manure in the pasture fields, irrigation water containing diluted nutrients from effluent, the effluent storage ponds, and the dairy buildings. Odor rates from published research were applied. Odor isopleths (a line used to map all points having the same numerical value) were created to display the model findings. Odor is described in "odor units" at the threshold of perception, which is defined by the point at which 50 percent of panelists, in laboratory conditions, cannot smell the odor but 50 percent of the panelists can detect the odor.

Modeling results were generated for worst case meteorological conditions (low wind velocity / mixing). Generally, tradewinds will disperse odors to less than detectable levels beyond the HDF site; in periods of no wind, odor may not be dispersed creating the "worst case" scenario. In these periods without normal tradewind flow, the odor plume would extend to the south of the HDF site. Sections 4.19.2 and 4.25.2 of the EIS include graphics of the potential odor isopleths.

Results for the committed herd size of 699 mature dairy cows show that odors may be detectable by 50 percent of the sensitive population once per 200 hours, or 44 hours per year, within an area that extends approximately 1,670-feet (within one-third of a mile) beyond the dairy farm boundary, and does not reach recreational or residential areas. Results for the contemplated expanded herd size of up to 2,000 mature dairy cows show odors would not extend beyond 2,780 feet outside the HDF boundary (just over half a mile), again not reaching recreational or residential areas, and again with detection limited to 50 percent of the sensitive population approximately 44 hours per year. The parameters used in the analysis were intentionally conservative, and the impacts shown assume an unlikely confluence of worst-case meteorological data, irrigation location, and grazing location. Actual offsite odor impacts are likely to be much lower and/or less frequent than shown; it is likely odor detection beyond the HDF boundaries will be less frequent.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

From: Liedeke Bulder <lbulderart@gmail.com>
Sent: Thursday, February 19, 2015 9:59 PM
To: HDF
Subject: Re: Hawaii Dairy Farms EIS Preparation

We appreciate your voluntary preparation for an EIS.

My deepest concern is for the erosion of what has been voted among the most beautiful of tropical islands.

What has happened to stewardship of the earth?? What has happened to respect for cultural and spiritual treasures? What will happen when your dairy project has ruined Kauai's first economic base, i.e. tourism, when waste and run off have contributed to more pollution of already precarious water conditions??

It has become very clear from numerous articles and reports in the TGI that a 'Zero-Discharge, Grass-Fed Dairy based on the New Zealand model' is a non starter. According to eyewitness reports these beaches in New Zealand are now polluted. Stench and flies are rampant. How will and can Hawaii Dairy Farms bring back this precious part of Kauai once it has been spoiled?

Furthermore, is your mission statement about providing Hawai`i's families with fresh local milk true, or is it merely a cover up for sending the milk ultimately to China? Where do you propose the milk be processed?

Any EIS should take all of the above mentioned issues seriously into consideration.

Respectfully submitted,

Liedeke Bulder and Dick Wright

Kalaheo residents

GROUP 70 INTERNATIONAL

May 26, 2016

Wright, Dick & Bulder, Liedeke
lbulderart@gmail.com

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Wright, Dick & Bulder, Liedeke:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

DAIRY OPERATIONS: Hawai'i Dairy Farms (HDF) will establish and operate a sustainable, pastoral rotational-grazing dairy farm in Māhā'ulepū Valley on the island of Kaua'i to produce fresh, locally available nutritious milk for Hawai'i families. The rotational-grazing method utilizes 100 percent of the cows' manure as natural fertilizer to grow pasture grass as a primary source of nutrition for dairy cows. This cost-effective method will reduce reliance on imported fertilizer and feed. Pasture grass will comprise at least 70 percent of the animals' diet. As a part of the Draft Environmental Impact Statement (EIS), the proposed facilities and operations for the dairy farm are described in Chapter 3.

The Environmental Impact Statement (EIS) Preparation Notice (EISPN), published January 23, 2015, described the proposed pasture-based rotational grazing system as a "zero-discharge, grass-fed dairy". The term "zero-discharge" under the U.S. Environmental Protection Agency related to concentrated feeding operations

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(CAFO) is a system designed to not discharge pollutants into waters of the United States. As noted previously, the HDF system is designed to utilize 100 percent of the cows' manure on-site. However, nutrients would be introduced to the HDF site with any use; the Draft EIS identifies the amount of nutrients anticipated from the proposed dairy operations that could pass through to ground and surface waters. Therefore, HDF elected to discontinue use of the term "zero discharge" as it was construed as no nutrients into the system.

The term "grass-fed" was used in the HDF EISPN. This term was used to identify HDF's intent to utilize a locally-produced feedstock – grass – for more than 70 percent of the dairy herds' diet. In January 2016, the U.S. Department of Agricultural (USDA) Marketing Survey created a narrow legal definition of "grass-fed". The USDA standard defines what animals can and cannot be fed. The Food Alliance, a project of several northwest colleges, believes that when consumers choose grass-fed products there is an expectation that these will come from animals raised on pasture on a forage-based diet. Due to the evolving definition of "grass-fed", the term in not used in this EIS.

The dairy facilities will occupy an area of approximately 10 acres on the western boundary of the site. The developed area "footprint" will be less than 2 percent of the total farm area. Four buildings will be constructed to serve different functions, supported by utilities and infrastructure. Additional building information can be found in Draft EIS Section 3.3.1.

Agricultural infrastructure and utilities required for the dairy operations will include storage tanks and silos, effluent storage ponds, livestock water systems, and drainage improvements. The irrigation system and distribution of livestock water are discussed in Draft EIS Section 3.5, Pasture Management.

The pastoral rotational-grazing dairy provides a local feedstock – grass – as the herd's primary food source. Reducing imported feed stabilizes costs and provides a food source closer to the natural diet of cows. Results of grass trials initially conducted at five sites across four Hawaiian Islands were instrumental in identifying appropriate varieties of grass, and suitable sites to support sufficient "dry matter" grass yields essential to a cow's diet. Additional project-specific trials at the Māhāʻulepū site on Kauai have been conducted for more than 18 months. The results have identified sufficient yield and nutrition to supply 70 percent of the cows' diet; improvements in grass productivity are anticipated to provide up to 85 percent of cows' diet.

The pasture-based model allows cows to move about freely, and to lie down and rest, which is part of the digestion cycle. The animals are managed in social groups known as "mobs", mimicking the natural social order of bovines. Cows spend 22 hours of each 24-hour period foraging on pasture or resting, outdoors in natural light and fresh air. The gently sloped paddocks, walkways and races minimize the energy expended by the mature dairy cows as they graze or are transferred to and from the various paddocks and the mature dairy facility; surfaces of the walkways and cow races are designed to provide a comfortable path under hoof. The management practices and pasture model applied by HDF maximizes grass as the

cows' primary nutrition source and minimizes stress to the animals. Cows tend to be healthier and live longer, productive lives with access to fresh air, high quality feed, and exercise while they forage.

The 470 acres of pasture will be divided into paddocks averaging 3 to 5 acres in size. Smaller paddocks located near the dairy facility will be used as temporary pasture for cows or calves being moved on or off the farm. To protect the water quality of surface water and downstream areas, paddock fences are set back 35 feet from the edge of drainage ways throughout the site. Existing vegetation within the setbacks will be managed or restored to reduce erosion, improve stability of ditch banks, increase net carbon storage, and improve and maintain water quality.

The majority of the pastures will be irrigated with non-potable water and/or diluted effluent through either the pivot irrigation systems or through gun irrigators. Irrigation water supply is provided to the farm from Waita Reservoir, and will be filtered and pumped to the various irrigation components on the farm. The irrigation system is controlled using computer software and GPS receivers to allow very precise application of irrigation and/or diluted effluent on the pasture. The pivots can rotate and apply irrigation water and/or diluted effluent at different rates depending on the actual irrigation needs of the farm.

NRCS provides technical guidance on applying agricultural waste depending on the desired use of the waste. Reflected in the title of the livestock waste guidance for Hawaiʻi is the parenthetical inclusion of the word "nutrients." Where waste is utilized as a resource, it is being used for the constituent components that provide benefit.

The NRCS Conservation Practice Standard 590, Nutrient Management, applies to commercial fertilizers, organic by-products, waste water, organic matter, and irrigation water. Nutrient management is the practice of managing the amount, rate, source, method of application, and timing of plant nutrients and soil amendments. The timing and application of nutrients will correspond with plant uptake, soil properties and weather conditions. For more information on nutrient balance management see Draft EIS Section 3.5.3, and Draft EIS Appendix D.

The effluent storage ponds are sized to accommodate 30 days of storage for up to 2,000 mature dairy cows, and over 85 days of storage for 699 mature dairy cows. It will be highly unlikely that the storage pond will be full at any time for the contemplated 2,000-cow dairy, and nearly impossible for the committed 699-cow dairy. Throughout the less than 30-day storage period, effluent is planned for application every four days, and the slurry application is expected at least once every 45 days, to ensure that the ponds are kept at manageable levels.

Cows lactate milk following the birth of calves. Newborn calves will be housed on the Māhāʻulepū site and provided essential colostrum and nutrients for a healthy start. During the calves' initial 90 days, they will be transitioned to pasture at HDF before transfer to ranches on Kauaʻi to be raised off-site. The committed herd size of 699 mature dairy cows at the Māhāʻulepū site applies to mature mature dairy cows. Animals in various stages of lactation and rest will be transferred between HDF and

other partner ranches as needed for animal health and dairy productivity. This will benefit both the dairy and infuse the beef market in Hawai'i with a new, local source of pasture-raised calves. Male calves will become part of the beef cattle herd; heifers (young female calves that haven't given birth) will be raised until ready to return to the HDF herd as a birthing/mature dairy cow. For more information on off-site herd management, refer to Section 3.7 of the Draft EIS.

Health of the herd is of primary importance as the success of a dairy relies on cows effectively producing quality milk. All cows will be treated with a high standard of care. Dairy managers and caretakers will be trained and competent in handling animals to minimize stress and ensure the herds' welfare. A licensed veterinarian may prescribe use of antibiotics approved by the Food & Drug Administration (FDA) for treatment of illnesses. Adherence to guidelines that prohibit milk from cows undergoing antibiotic treatment will ensure no adulteration of milk. Routine laboratory tests of milk for traces of antibiotic residue will be conducted. HDF will not inject cows with bovine growth hormone, referred to as rBST or rBGH.

DEMOGRAPHIC AND ECONOMIC: The potential impacts of Hawai'i Dairy Farms (HDF) to the existing economy were evaluated in the Draft Environmental Impact Statement (EIS), including a fiscal impact assessment report completed in April, 2016 by Plasch Economics Pacific. Draft EIS Section 4.15 addresses demographic and economic factors, with the complete report in Appendix J.

The HDF project would create short-term benefits through jobs for local construction personnel and local material suppliers. Such jobs would include equipment operators, cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, supervisors, painters, etc. Based on State employment multipliers, indirect employment related to Dairy construction would be expected to average about 16 jobs on Kaua'i, and 8 on O'ahu. Construction employment would be expected to average about 12 jobs per year during the development period. Thus direct-plus-indirect employment association with construction would be expected to average approximately 36 jobs, of which 28 would be on Kaua'i.

The HDF project would contribute to diversification of Kaua'i's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Hawai'i Island), approximately10 percent of Hawai'i's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and indirect full-time equivalent jobs on Kaua'i, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on O'ahu.

HDF is expected to generate a net income of approximately $68,000 to the County when the 699 cow herd is established. When the dairy has matured to full production for the 699 cow dairy, net income to the State is calculated at $160,000 annually. With the potential contemplated herd size of up to 2,000 mature dairy

cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be produced. This would double local milk production currently supplied by operational dairies on the Island of Hawai'i.

Additional employment generated by a possible expansion to accommodate the contemplated 2,000 mature dairy cow herd is estimated at approximately 3 construction jobs plus 4 indirect jobs on Kaua'i, and 2 indirect jobs on O'ahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an additional 5 full-time farm jobs would be added, with approximately 15 additional indirect jobs on Kaua'i and another 8 indirect jobs on O'ahu.

The dairy is expected to generate a net additional contribution to the County of approximately $8,000 for improvements related to expansion for the contemplated herd size of up to 2,000 mature dairy cows ($76,000 total versus $68,000 for the committed herd size). The State will derive approximately $360,000 annually in revenues from the contemplated 2,000-mature dairy cow dairy.

Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

RECEIVED

FEB 25 2015

GROUP 70 INTL

To whom it may concern,

I am writing to express my concerned about recent development of a dairy farm in beautiful Maha`ulepu Valley here on the island of Kauai by Hawaii dairy Farms

Having over two thousand cows on just six hundred acres is woefully overcrowded for the scale of proposed operation. The waste from such a dairy farm affects the local ecosystem by contaminating local rivers and in turn local ground water wells; conservation of our natural resources is of the upmost importance and any threat to our our precious water supply must be seriously considered now and for future generations. This farm will also create a stench that can be detected for miles and attract s horde of flys and insects.

The health of the residents of Kauai must also be carefully considered. The use of genetically modified feed for livestock as well as the use of antibiotics for these animals poses a direct risk to the health of any who consume these products.

The close proximity of this operation to local cities (Koloa is only two miles away) guarantees not only a health risk but also an economic risk. Tourism is of vital importance to the economy of Kauai and building a dairy farm in one of our most popular tourist destinations is certain to have a negative impact. The passage of agricultural operations through local towns in addition to the changes to this ecosystem will affect property values and contribute to the loss of local jobs.

I have listened to the Hawaii Dairy Farms arguments and they do not adequately address the issues I bring to you. We need help here on Kauai to do what is right and preserve local spaces as natural treasures and vital sources of health for our economies and our people. Please do not let Hawaii Dairy Farms continue to have a negative impact or our beautiful garden island!

Thank you for your consideration on this matter.

Sincerely ,

Joanne Burkhardt

JB Burkhardt

GROUP 70 INTERNATIONAL

May 26, 2016

Joanne Burkhardt
P.O. Box 743
Hanapepe, HI 96716

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Joanne Burkhardt:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

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Environmental Protection Agency related to concentrated feeding operations (CAFO) is a system designed to not discharge pollutants into waters of the United States. As noted previously, the HDF system is designed to utilize 100 percent of the cows' manure on-site. However, nutrients would be introduced to the HDF site with any use; the Draft EIS identifies the amount of nutrients anticipated from the proposed dairy operations that could pass through to ground and surface waters. Therefore, HDF elected to discontinue use of the term "zero discharge" as it was construed as no nutrients into the system.

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management practices and pasture model applied by HDF maximizes grass as the cows' primary nutrition source and minimizes stress to the animals. Cows tend to be healthier and live longer, productive lives with access to fresh air, high quality feed, and exercise while they forage.

The 470 acres of pasture will be divided into paddocks averaging 3 to 5 acres in size. Smaller paddocks located near the dairy facility will be used as temporary pasture for cows or calves being moved on or off the farm. To protect the water quality of surface water and downstream areas, paddock fences are set back 35 feet from the edge of drainage ways throughout the site. Existing vegetation within the setbacks will be managed or restored to reduce erosion, improve stability of ditch banks, increase net carbon storage, and improve and maintain water quality.

The majority of the pastures will be irrigated with non-potable water and/or diluted effluent through either the pivot irrigation systems or through gun irrigators. Irrigation water supply is provided to the farm from Waita Reservoir, and will be filtered and pumped to the various irrigation components on the farm. The irrigation system is controlled using computer software and GPS receivers to allow very precise application of irrigation and/or diluted effluent on the pasture. The pivots can rotate and apply irrigation water and/or diluted effluent at different rates depending on the actual irrigation needs of the farm.

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The HDF project would contribute to diversification of Kaua'i's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Hawai'i Island), approximately10 percent of Hawai'i's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and indirect full-time equivalent jobs on Kaua'i, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on O'ahu.

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annually. With the potential contemplated herd size of up to 2,000 mature dairy cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be produced. This would double local milk production currently supplied by operational dairies on the Island of Hawai'i.

Additional employment generated by a possible expansion to accommodate the contemplated 2,000 mature dairy cow herd is estimated at approximately 3 construction jobs plus 4 indirect jobs on Kaua'i, and 2 indirect jobs on O'ahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an additional 5 full-time farm jobs would be added, with approximately 15 additional indirect jobs on Kaua'i and another 8 indirect jobs on O'ahu.

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Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhā'ulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The

aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhāʻulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Poʻipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhāʻulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawaiʻi Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhāʻulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhāʻulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhāʻulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water

quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kauaʻi community.

Regional Water Demand: The adjacent, developed Kōloa-Poʻipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kauaʻi will increase county-wide by 17,300 residents by 2030. The South Kauaʻi population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kauaʻi region (the Kōloa - Poʻipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhāʻulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhāʻulepū watershed.

The HDF site is located on the bottom-land of the upper Māhāʻulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Haʻupu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhāʻulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kauaʻi Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi

Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhāʻulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhāʻulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhāʻulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural

fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Poʻipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water

masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kaua'i community.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

February 19, 2015

Group 70 International, Inc.
925 Bethel Street, 5th floor
Honolulu, HI 96813

RE: Hawaii Dairy Farms

Dear Sirs:

I am adamantly opposed to the proposed industrial dairy in Maha'ulepu Valley. It is unconscionable for anyone to consider doing something so damaging to ALL aspects of the environment, as well as endangering the health and economic welfare of the community. It is of utmost importance for these issues to be addressed and answered by the EIS.

Very truly yours,

Mrs. Robert E. Burns

Mrs. Robert E. Burns
Owner, Kahala 223
12512 Fraser Avenue
Granada Hills, CA 91344-1321

Cc: file

GROUP 70
INTERNATIONAL

May 26, 2016

Mrs. Robert E. Burns
12512 Fraser Avenue
Granada Hills, CA 91344-1321

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Mrs. Robert E. Burns:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

DAIRY OPERATIONS: Hawai'i Dairy Farms (HDF) will establish and operate a sustainable, pastoral rotational-grazing dairy farm in Māhā'ulepū Valley on the island of Kaua'i to produce fresh, locally available nutritious milk for Hawai'i families. The rotational-grazing method utilizes 100 percent of the cows' manure as natural fertilizer to grow pasture grass as a primary source of nutrition for dairy cows. This cost-effective method will reduce reliance on imported fertilizer and feed. Pasture grass will comprise at least 70 percent of the animals' diet. As a part of the Draft Environmental Impact Statement (EIS), the proposed facilities and operations for the dairy farm are described in Chapter 3.

The Environmental Impact Statement (EIS) Preparation Notice (EISPN), published January 23, 2015, described the proposed pasture-based rotational grazing system as a "zero-discharge, grass-fed dairy". The term "zero-discharge" under the U.S.

Environmental Protection Agency related to concentrated feeding operations (CAFO) is a system designed to not discharge pollutants into waters of the United States. As noted previously, the HDF system is designed to utilize 100 percent of the cows' manure on-site. However, nutrients would be introduced to the HDF site with any use; the Draft EIS identifies the amount of nutrients anticipated from the proposed dairy operations that could pass through to ground and surface waters. Therefore, HDF elected to discontinue use of the term "zero discharge" as it was construed as no nutrients into the system.

The term "grass-fed" was used in the HDF EISPN. This term was used to identify HDF's intent to utilize a locally-produced feedstock – grass – for more than 70 percent of the dairy herds' diet. In January 2016, the U.S. Department of Agricultural (USDA) Marketing Survey created a narrow legal definition of "grass-fed". The USDA standard defines what animals can and cannot be fed. The Food Alliance, a project of several northwest colleges, believes that when consumers choose grass-fed products there is an expectation that these will come from animals raised on pasture on a forage-based diet. Due to the evolving definition of "grass-fed", the term in not used in this EIS.

The dairy facilities will occupy an area of approximately 10 acres on the western boundary of the site. The developed area "footprint" will be less than 2 percent of the total farm area. Four buildings will be constructed to serve different functions, supported by utilities and infrastructure. Additional building information can be found in Draft EIS Section 3.3.1.

Agricultural infrastructure and utilities required for the dairy operations will include storage tanks and silos, effluent storage ponds, livestock water systems, and drainage improvements. The irrigation system and distribution of livestock water are discussed in Draft EIS Section 3.5, Pasture Management.

The pastoral rotational-grazing dairy provides a local feedstock – grass – as the herd's primary food source. Reducing imported feed stabilizes costs and provides a food source closer to the natural diet of cows. Results of grass trials initially conducted at five sites across four Hawaiian Islands were instrumental in identifying appropriate varieties of grass, and suitable sites to support sufficient "dry matter" grass yields essential to a cow's diet. Additional project-specific trials at the Māhā'ulepū site on Kauai have been conducted for more than 18 months. The results have identified sufficient yield and nutrition to supply 70 percent of the cows' diet; improvements in grass productivity are anticipated to provide up to 85 percent of cows' diet.

The pasture-based model allows cows to move about freely, and to lie down and rest, which is part of the digestion cycle. The animals are managed in social groups known as "mobs", mimicking the natural social order of bovines. Cows spend 22 hours of each 24-hour period foraging on pasture or resting, outdoors in natural light and fresh air. The gently sloped paddocks, walkways and races minimize the energy expended by the mature dairy cows as they graze or are transferred to and from the various paddocks and the mature dairy facility; surfaces of the walkways and cow races are designed to provide a comfortable path under hoof. The

management practices and pasture model applied by HDF maximizes grass as the cows' primary nutrition source and minimizes stress to the animals. Cows tend to be healthier and live longer, productive lives with access to fresh air, high quality feed, and exercise while they forage.

The 470 acres of pasture will be divided into paddocks averaging 3 to 5 acres in size. Smaller paddocks located near the dairy facility will be used as temporary pasture for cows or calves being moved on or off the farm. To protect the water quality of surface water and downstream areas, paddock fences are set back 35 feet from the edge of drainage ways throughout the site. Existing vegetation within the setbacks will be managed or restored to reduce erosion, improve stability of ditch banks, increase net carbon storage, and improve and maintain water quality.

The majority of the pastures will be irrigated with non-potable water and/or diluted effluent through either the pivot irrigation systems or through gun irrigators. Irrigation water supply is provided to the farm from Waita Reservoir, and will be filtered and pumped to the various irrigation components on the farm. The irrigation system is controlled using computer software and GPS receivers to allow very precise application of irrigation and/or diluted effluent on the pasture. The pivots can rotate and apply irrigation water and/or diluted effluent at different rates depending on the actual irrigation needs of the farm.

NRCS provides technical guidance on applying agricultural waste depending on the desired use of the waste. Reflected in the title of the livestock waste guidance for Hawai'i is the parenthetical inclusion of the word "nutrients." Where waste is utilized as a resource, it is being used for the constituent components that provide benefit.

The NRCS Conservation Practice Standard 590, Nutrient Management, applies to commercial fertilizers, organic by-products, waste water, organic matter, and irrigation water. Nutrient management is the practice of managing the amount, rate, source, method of application, and timing of plant nutrients and soil amendments. The timing and application of nutrients will correspond with plant uptake, soil properties and weather conditions. For more information on nutrient balance management see Draft EIS Section 3.5.3, and Draft EIS Appendix D.

The effluent storage ponds are sized to accommodate 30 days of storage for up to 2,000 mature dairy cows, and over 85 days of storage for 699 mature dairy cows. It will be highly unlikely that the storage pond will be full at any time for the contemplated 2,000-cow dairy, and nearly impossible for the committed 699-cow dairy. Throughout the less than 30-day storage period, effluent is planned for application every four days, and the slurry application is expected at least once every 45 days, to ensure that the ponds are kept at manageable levels.

Cows lactate milk following the birth of calves. Newborn calves will be housed on the Māhā'ulepū site and provided essential colostrum and nutrients for a healthy start. During the calves' initial 90 days, they will be transitioned to pasture at HDF before transfer to ranches on Kaua'i to be raised off-site. The committed herd size of 699 mature dairy cows at the Māhā'ulepū site applies to mature mature dairy cows.

Animals in various stages of lactation and rest will be transferred between HDF and other partner ranches as needed for animal health and dairy productivity. This will benefit both the dairy and infuse the beef market in Hawai'i with a new, local source of pasture-raised calves. Male calves will become part of the beef cattle herd; heifers (young female calves that haven't given birth) will be raised until ready to return to the HDF herd as a birthing/mature dairy cow. For more information on off-site herd management, refer to Section 3.7 of the Draft EIS.

Health of the herd is of primary importance as the success of a dairy relies on cows effectively producing quality milk. All cows will be treated with a high standard of care. Dairy managers and caretakers will be trained and competent in handling animals to minimize stress and ensure the herds' welfare. A licensed veterinarian may prescribe use of antibiotics approved by the Food & Drug Administration (FDA) for treatment of illnesses. Adherence to guidelines that prohibit milk from cows undergoing antibiotic treatment will ensure no adulteration of milk. Routine laboratory tests of milk for traces of antibiotic residue will be conducted. HDF will not inject cows with bovine growth hormone, referred to as rBST or rBGH.

DEMOGRAPHIC AND ECONOMIC: The potential impacts of Hawai'i Dairy Farms (HDF) to the existing economy were evaluated in the Draft Environmental Impact Statement (EIS), including a fiscal impact assessment report completed in April, 2016 by Plasch Economics Pacific. Draft EIS Section 4.15 addresses demographic and economic factors, with the complete report in Appendix J.

The HDF project would create short-term benefits through jobs for local construction personnel and local material suppliers. Such jobs would include equipment operators, cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, supervisors, painters, etc. Based on State employment multipliers, indirect employment related to Dairy construction would be expected to average about 16 jobs on Kaua'i, and 8 on O'ahu. Construction employment would be expected to average about 12 jobs per year during the development period. Thus direct-plus-indirect employment association with construction would be expected to average approximately 36 jobs, of which 28 would be on Kaua'i.

The HDF project would contribute to diversification of Kaua'i's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Hawai'i Island), approximately10 percent of Hawai'i's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and indirect full-time equivalent jobs on Kaua'i, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on O'ahu.

HDF is expected to generate a net income of approximately $68,000 to the County when the 699 cow herd is established. When the dairy has matured to full production for the 699 cow dairy, net income to the State is calculated at $160,000

annually. With the potential contemplated herd size of up to 2,000 mature dairy cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be produced. This would double local milk production currently supplied by operational dairies on the Island of Hawai'i.

Additional employment generated by a possible expansion to accommodate the contemplated 2,000 mature dairy cow herd is estimated at approximately 3 construction jobs plus 4 indirect jobs on Kaua'i, and 2 indirect jobs on O'ahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an additional 5 full-time farm jobs would be added, with approximately 15 additional indirect jobs on Kaua'i and another 8 indirect jobs on O'ahu.

The dairy is expected to generate a net additional contribution to the County of approximately $8,000 for improvements related to expansion for the contemplated herd size of up to 2,000 mature dairy cows ($76,000 total versus $68,000 for the committed herd size). The State will derive approximately $360,000 annually in revenues from the contemplated 2,000-mature dairy cow dairy.

Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

From: George C. <gmc545@yahoo.com>
Sent: Sunday, February 22, 2015 3:56 PM
To: HDF; laura.mcintyre@doh.hawaii.gov
Subject: Hawaii Dairy Farms
Attachments: Hawaii Dairy Farms Letter 2.21.15.docx

Aloha,

We hope the attached letter is read by you and our message is given serious consideration -- it's from our hearts.

Mahalo,

George and Donna Carrick.

Donna and George Carrick
1565 Pe'e Road
Koloa, HI 96756

February 21, 2015

RECEIVED

FEB 2 7 2

GROUP 70 INTL

Laura McIntyre
State of Hawai'i
Department of Health
1250 Punchbowl Street
Honolulu, HI 96813

Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, HI 96813

Jeff Overton
Hawai'i Dairy Farms, LLC
P.O. Box 1690
Koloa, HI 96756-1690

Aloha,

As homeowners in Poipu since 2003, we are writing to express and formally register our serious alarm over the proposed Animal Feeding Operation, Hawaii Dairy Farms, LLC.

We love Poipu and Kauai -- this very special and truly unique place. We swim, surf and snorkel in the beautiful, clear waters, hike the pristine shorelines and explore many of the gorgeous valleys and natural spots of beauty. Also, we have our home in a rental program with many repeat guests who look forward so much to escaping to this unique and unpolluted environment -- "their experience in paradise."

We are extremely concerned about the imminent damages of this proposed, large dairy operation.

Our research confirms that the negative impacts to the water, air, sea life, animal life and human life would be irretrievable. Of equal or greater importance would be the severe, debilitating economic impact on tourism which is foundational to the livelihood of all Kauai residents.

Given all the compelling evidence and research, we must resolutely conclude that it would be a travesty of justice and deficiency of concern for human dignity for those elected and appointed officials whose mandate it is to protect the people, infrastructures and economic underpinnings of Kauai and Hawai as a whole to even consider granting the necessary permits and approvals to allow Hawaii Dairy Farms to proceed with its ill-conceived plan – IT MUST BE STOPPED, NOW.

Mahalo,

Donna Carrick Geo Carrick

Donna and George Carrick.

cc: Bridget Hammerquist, on behalf of
Friends of Maha'ulepu
P.O. Box: 1654
Koloa, HI 96756

GROUP 70 INTERNATIONAL

May 26, 2016

George and Donna Carrick
1565 Pe'e Road
Koloa HI 96756
gmc545@yahoo.com

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear George and Donna Carrick:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

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The following responses are offered to your comments:

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employment would be expected to average about 12 jobs per year during the development period. Thus direct-plus-indirect employment association with construction would be expected to average approximately 36 jobs, of which 28 would be on Kaua'i.

The HDF project would contribute to diversification of Kaua'i's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Hawai'i Island), approximately10 percent of Hawai'i's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and indirect full-time equivalent jobs on Kaua'i, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on O'ahu.

HDF is expected to generate a net income of approximately $68,000 to the County when the 699 cow herd is established. When the dairy has matured to full production for the 699 cow dairy, net income to the State is calculated at $160,000 annually. With the potential contemplated herd size of up to 2,000 mature dairy cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be produced. This would double local milk production currently supplied by operational dairies on the Island of Hawai'i.

Additional employment generated by a possible expansion to accommodate the contemplated 2,000 mature dairy cow herd is estimated at approximately 3 construction jobs plus 4 indirect jobs on Kaua'i, and 2 indirect jobs on O'ahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an additional 5 full-time farm jobs would be added, with approximately 15 additional indirect jobs on Kaua'i and another 8 indirect jobs on O'ahu.

The dairy is expected to generate a net additional contribution to the County of approximately $8,000 for improvements related to expansion for the contemplated herd size of up to 2,000 mature dairy cows ($76,000 total versus $68,000 for the committed herd size). The State will derive approximately $360,000 annually in revenues from the contemplated 2,000-mature dairy cow dairy.

Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E

and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhā'ulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhā'ulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Po'ipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhā'ulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawai'i Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhā'ulepū 14 well during the sugarcane

plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhāʻulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhāʻulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kauaʻi community.

Regional Water Demand: The adjacent, developed Kōloa-Poʻipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kauaʻi will increase county-wide by 17,300 residents by 2030. The South Kauaʻi population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kauaʻi region (the Kōloa - Poʻipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhāʻulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhāʻulepū watershed.

The HDF site is located on the bottom-land of the upper Māhāʻulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Haʻupu Ridge. These normally dry streams converge into man-made channels running

through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhāʻulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kauaʻi Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhāʻulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhāʻulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhāʻulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or

maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater

and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Poʻipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kauaʻi community.

AIR QUALITY: As a part of the Environmental Impact Statement (EIS), existing air quality conditions and project impacts were evaluated, including dust and odor. Potential odors and emission levels for air pollutants relevant to dairy operations were modeled, as currently there are no cows on site. EIS sections 4.19 and 4.25 provide an evaluation of air quality and odors, including a windrose depicting wind speed and direction in the area (see DEIS Section 4.1, Climate). The full air quality technical report can be found in Draft EIS Appendix I.

Clean Air Act

Under the *Clean Air Act of 1970* (CAA), amended November 1990, the U.S. Environmental Protection Agency (EPA) regulates both large and small sources of air pollutants by establishing National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. The State of Hawaiʻi has established its own *State Ambient Air Quality Standards* (SAAQS) that are as strict or, in some cases more strict than the

NAAQS. State standards prohibit any visible emissions of fugitive dust from construction activities at the property line.

Emissions relevant to livestock operation include particulate matter and fugitive dust. Greenhouse gases related to dairy cows include methane (CH_4) from enteric fermentation, and both methane and nitrous oxide (N_20) emissions from manure application. No State or Federal regulations for greenhouse gas emissions from farm operations or small businesses currently exist.

DUST

Dust will be generated as cows move along soft limestone walkways that connect the paddocks and lead to and from the milking parlor. Potential fugitive dust emission rates were estimated from published literature, where particulate matter (PM) is measurable from the "drylots" of confined dairy operations where animals walk over dirt and dried manure throughout the day.

Applying the emission rates from this available literature greatly overestimates potential emission resulting from HDF. Cows in the pastoral rotational-grazing system will be on pasture 22 hours each day and will spend two hours – in two separate milking cycles –moving to and from the barn for the 10- to 15-minute milking sessions.

Using atmospheric dispersion modeling system (AERMOD), the rates were scaled to the size of the non-pasture areas used by cows at HDF. Results were added to the background concentration of particulate matter (both PM_{10} and $PM_{2.5}$) measured on the island of Kaua'i, and the total concentration was compared to the State ambient air quality standards. Only the contemplated herd size of up to 2,000 mature dairy cows was modeled, as at the lower threshold of 699 cows, the potential fugitive dust impact would be negligible. The estimated concentration for PM_{10} is 2.01 $\mu g/m^3$, well below the State standard of 150 $\mu g/m^3$. The estimated concentration for $PM_{2.5}$ is 0.23 $\mu g/m^3$, well below the Federal standard of 35 $\mu g/m^3$ (see Draft EIS Section 4.19 and Table 4-19.2).

ODOR

Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF, so air dispersion models were used to determine potential odor levels. Local weather data was used in conjunction with the AERMOD modeling system, and published rates for manure odors emissions for dairy heifers and effluent ponds were adapted to reflect the HDF facilities.

Odor emission sources identified for modeling at HDF were manure in the pasture fields, irrigation water containing diluted nutrients from effluent, the effluent storage ponds, and the dairy buildings. Odor rates from published research were applied. Odor isopleths (a line used to map all points having the same numerical value) were created to display the model findings. Odor is described in "odor units" at the threshold of perception, which is defined by the point at which 50 percent of

panelists, in laboratory conditions, cannot smell the odor but 50 percent of the panelists can detect the odor.

Modeling results were generated for worst case meteorological conditions (low wind velocity / mixing). Generally, tradewinds will disperse odors to less than detectable levels beyond the HDF site; in periods of no wind, odor may not be dispersed creating the "worst case" scenario. In these periods without normal tradewind flow, the odor plume would extend to the south of the HDF site. Sections 4.19.2 and 4.25.2 of the EIS include graphics of the potential odor isopleths.

Results for the committed herd size of 699 mature dairy cows show that odors may be detectable by 50 percent of the sensitive population once per 200 hours, or 44 hours per year, within an area that extends approximately 1,670-feet (within one-third of a mile) beyond the dairy farm boundary, and does not reach recreational or residential areas. Results for the contemplated expanded herd size of up to 2,000 mature dairy cows show odors would not extend beyond 2,780 feet outside the HDF boundary (just over half a mile), again not reaching recreational or residential areas, and again with detection limited to 50 percent of the sensitive population approximately 44 hours per year. The parameters used in the analysis were intentionally conservative, and the impacts shown assume an unlikely confluence of worst-case meteorological data, irrigation location, and grazing location. Actual offsite odor impacts are likely to be much lower and/or less frequent than shown; it is likely odor detection beyond the HDF boundaries will be less frequent.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

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Hawaii Dairy Farms, LLC
P.O. Box 1690
Koloa HI 96756-1690
Attn: Jeff Overton

February 19, 2015

I am writing to express my dismay concerning plans to establish an extensive new dairy in the Mahaulepo Valley of Kauai, as proposed by Hawaii Dairy Farms.

I understand that an environmental impact statement will soon be prepared. It should be obvious to all, that this dairy, as planned, will have a certain detrimental impact on many areas of our environment. In addition, both the economic impact, and negative social impact to our community, would outweigh any potential advantage for Kauai.

I currently spend approximately two months on Kauai as an owner of a condominium in Poipu.

We bought there, knowing it is one of the most beautiful and enjoyable places imaginable. This beauty will be affected, and the lives of all of the permanent residents, guests and tourists will be adversely affected by the dairy's plans.

From a public health perspective, it is clear that the toxic waste produced by the initial 699 cows is in itself a threat to the water supply. The expansion to 2000 cows will overwhelm the system. The amount of manure and urine produced, and kept locally, will produce runoff. Nearby streams, specifically the Waiopili and Waiolaau will be contaminated and ultimately the runoff will enter the ocean, and the shoreline, upsetting its already fragile ecosystem. The soil in our area, being clay based, cannot handle this very large toxic load. Millions of pounds of manure and urine waste produced annually cannot be resorbed. Our reefs are at stake. We have protected species of ocean and shore birds that will suffer as a result as well.

Furthermore, this toxic waste will be deposited near county wells that serve the population of Poipu and Koloa. We cannot tolerate this potential risk and its longstanding and serious consequences to our water system.

I have read recently, as I suspect you have as well, stories in the Garden Island newspaper, reporting the problems which already exist with pollution in the Waiopili Stream. While it is uncertain whether this comes from feral pigs or possible human contamination, it should be obvious that 2000 cows will add significantly, perhaps catastrophically to this problem. How could it not?

I have read the information put forth by Hawaii Dairy Farms in their EISPN. It speaks of utilizing a New Zealand technique for management on the dairy farm. Having just travelled through New Zealand, and having seen many cows grazing there, I would point out some important differences as I see them. First of all, the area of New Zealand is quite large, with vast rural spaces, and the cows appear to be considerably further from residential and tourist areas. The density of the cows would appear to be far less than what is currently planned for our area on Kauai. And lastly, and importantly, there are problems and concerns even in New Zealand that we heard about while travelling there, regarding these same issues, so it should not be assumed that by following some of their methodology, that the dairy would clearly avoid the problems that are bound to occur.

With regards to the economic and social welfare to the community, one can only conclude that overall, this proposed dairy will have profound negative affects. The beauty of the island is at risk. Living in California, and driving by some of the cattle farms there, would convince you not to buy in or visit Kauai, if a dairy of this size and location is permitted. The odors produced will be substantial, and be windswept to many areas. The wonderful outdoors, enjoyed by me and others as we visit the beaches and shoreline, will no longer be attractive. I enjoy hiking, biking, and snorkeling, and all of these activities will be impacted. Furthermore, cows will attract flies, and with all of the manure and urine produced and staying locally, these flies and other insects will become an appreciable problem causing discomfort and possible health risks to our residents and visitors. Do we expect the flies to restrict themselves to the dairy farm? I have heard of the possibility of bringing other insects in to help mitigate against the fly population. Perhaps, if that is true, one expects that organism will also be trained to stay within the confines of the dairy farm. We all should learn from the many failed experiments where a predator has been brought in to handle a problem, and then became part of a larger problem, rather than a solution to the original one.

I have already discussed the impact on the water system, and its health consequences.

As all of these impacts develop, tourism will decrease, and direct tax revenues from tourists will be lost. When tourism decreases, jobs will be lost, and tax revenues will decrease further. More will be unemployed, resulting in need for more government assistance. Property values will decline, again with a resultant loss of tax base to the community. Overall, to make up for these losses, additional sources of tax revenue will be necessary, and taxes to the local residents, who can ill afford it, will have to rise.

I do not understand how our government officials cannot see how potentially devastating this proposal is to so many people. I do not see a milk supply shortage on the island that makes this a necessary benefit for our residents. As the milk will be processed off island, I see no pledge that milk prices will be slashed to benefit our local residents. And since the processing will not be done on Kauai, the number of jobs involved will pale against the number of jobs that will be lost as a result of loss of tourism, and further more reasonable building and expansion on the island.

I imagine that the environmental impact statement could detail ways in which the dairy could mitigate against the many serious insults our environment and community will suffer from. The key here is that mitigation techniques may reduce the dangers to some degree, but you cannot eliminate the very

serious consequences our community, our residents, our environment, and our businesses will suffer from.

I must, as well, express serious concern regarding who will perform the actual EIS. As I read the EIS Preparation notice, it is quite clear that the authors of this paper approach it from a point of bias, attempting to convince us that all of these points will be addressed, and mitigation achieved. I do hope that a truly independent group can perform the actual EIS. Otherwise, there is no hope for an honest, independent survey, the goal of which should be to protect the welfare of the entire community, not the interest of the applicant.

I urge you to keep the greater good of and protection of our community at the forefront of your consideration. This project benefits only a small number of businessmen, not Kauai as a whole.

Sincerely,

Michael and Andrea Cassidy

17 Fairlawn Drive

Berkeley, California 94708

mjcassidy48@gmail.com

GROUP 70 INTERNATIONAL

May 26, 2016

Michael and Andrea Cassidy
17 Fairlawn Drive
Berkeley, CA 94708
mjcassidy48@gmail.com

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Michael and Andrea Cassidy:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

GROUP 70 OBJECTIVITY: Group 70 International, Inc. (Group 70) is responsible for the preparation and processing of the Hawai'i Dairy Farms Environmental Impact Statement (EIS). The EIS was prepared in accordance with the requirements of Chapter 343 Hawai'i Revised Statutes and the "Environmental Impact Statement Rules" (Chapter 200 of Title 11, Hawai'i Administrative Rules). The environmental planning team at Group 70 has prepared several hundred Environmental Assessment and EIS documents over the past 40 years, and every document has been accepted by the responsible County, State and Federal agency. On numerous past EIS projects, the Hawai'i Chapter of the American Planning Association has recognized Group 70's professional work with Chapter awards for excellence in environmental planning. Part of the EIS scoping process involves Group 70's

experienced team of technical sub consultants that are well-known and qualified in their respective fields of study. For this project, Group 70 is preparing the Hawai'i Dairy Farms EIS with the level of analysis required to properly evaluate and disclose the existing environmental conditions, probable impacts with mitigation, and potential cumulative and secondary effects.

DAIRY OPERATIONS: Hawai'i Dairy Farms (HDF) will establish and operate a sustainable, pastoral rotational-grazing dairy farm in Māhā'ulepū Valley on the island of Kaua'i to produce fresh, locally available nutritious milk for Hawai'i families. The rotational-grazing method utilizes 100 percent of the cows' manure as natural fertilizer to grow pasture grass as a primary source of nutrition for dairy cows. This cost-effective method will reduce reliance on imported fertilizer and feed. Pasture grass will comprise at least 70 percent of the animals' diet. As a part of the Draft Environmental Impact Statement (EIS), the proposed facilities and operations for the dairy farm are described in Chapter 3.

The Environmental Impact Statement (EIS) Preparation Notice (EISPN), published January 23, 2015, described the proposed pasture-based rotational grazing system as a "zero-discharge, grass-fed dairy". The term "zero-discharge" under the U.S. Environmental Protection Agency related to concentrated feeding operations (CAFO) is a system designed to not discharge pollutants into waters of the United States. As noted previously, the HDF system is designed to utilize 100 percent of the cows' manure on-site. However, nutrients would be introduced to the HDF site with any use; the Draft EIS identifies the amount of nutrients anticipated from the proposed dairy operations that could pass through to ground and surface waters. Therefore, HDF elected to discontinue use of the term "zero discharge" as it was construed as no nutrients into the system.

The term "grass-fed" was used in the HDF EISPN. This term was used to identify HDF's intent to utilize a locally-produced feedstock – grass – for more than 70 percent of the dairy herds' diet. In January 2016, the U.S. Department of Agricultural (USDA) Marketing Survey created a narrow legal definition of "grass-fed". The USDA standard defines what animals can and cannot be fed. The Food Alliance, a project of several northwest colleges, believes that when consumers choose grass-fed products there is an expectation that these will come from animals raised on pasture on a forage-based diet. Due to the evolving definition of "grass-fed", the term in not used in this EIS.

The dairy facilities will occupy an area of approximately 10 acres on the western boundary of the site. The developed area "footprint" will be less than 2 percent of the total farm area. Four buildings will be constructed to serve different functions, supported by utilities and infrastructure. Additional building information can be found in Draft EIS Section 3.3.1.

Agricultural infrastructure and utilities required for the dairy operations will include storage tanks and silos, effluent storage ponds, livestock water systems, and drainage improvements. The irrigation system and distribution of livestock water are discussed in Draft EIS Section 3.5, Pasture Management.

The pastoral rotational-grazing dairy provides a local feedstock – grass – as the herd's primary food source. Reducing imported feed stabilizes costs and provides a food source closer to the natural diet of cows. Results of grass trials initially conducted at five sites across four Hawaiian Islands were instrumental in identifying appropriate varieties of grass, and suitable sites to support sufficient "dry matter" grass yields essential to a cow's diet. Additional project-specific trials at the Māhā'ulepū site on Kauai have been conducted for more than 18 months. The results have identified sufficient yield and nutrition to supply 70 percent of the cows' diet; improvements in grass productivity are anticipated to provide up to 85 percent of cows' diet.

The pasture-based model allows cows to move about freely, and to lie down and rest, which is part of the digestion cycle. The animals are managed in social groups known as "mobs", mimicking the natural social order of bovines. Cows spend 22 hours of each 24-hour period foraging on pasture or resting, outdoors in natural light and fresh air. The gently sloped paddocks, walkways and races minimize the energy expended by the mature dairy cows as they graze or are transferred to and from the various paddocks and the mature dairy facility; surfaces of the walkways and cow races are designed to provide a comfortable path under hoof. The management practices and pasture model applied by HDF maximizes grass as the cows' primary nutrition source and minimizes stress to the animals. Cows tend to be healthier and live longer, productive lives with access to fresh air, high quality feed, and exercise while they forage.

The 470 acres of pasture will be divided into paddocks averaging 3 to 5 acres in size. Smaller paddocks located near the dairy facility will be used as temporary pasture for cows or calves being moved on or off the farm. To protect the water quality of surface water and downstream areas, paddock fences are set back 35 feet from the edge of drainage ways throughout the site. Existing vegetation within the setbacks will be managed or restored to reduce erosion, improve stability of ditch banks, increase net carbon storage, and improve and maintain water quality.

The majority of the pastures will be irrigated with non-potable water and/or diluted effluent through either the pivot irrigation systems or through gun irrigators. Irrigation water supply is provided to the farm from Waita Reservoir, and will be filtered and pumped to the various irrigation components on the farm. The irrigation system is controlled using computer software and GPS receivers to allow very precise application of irrigation and/or diluted effluent on the pasture. The pivots can rotate and apply irrigation water and/or diluted effluent at different rates depending on the actual irrigation needs of the farm.

NRCS provides technical guidance on applying agricultural waste depending on the desired use of the waste. Reflected in the title of the livestock waste guidance for Hawai'i is the parenthetical inclusion of the word "nutrients." Where waste is utilized as a resource, it is being used for the constituent components that provide benefit.

The NRCS Conservation Practice Standard 590, Nutrient Management, applies to commercial fertilizers, organic by-products, waste water, organic matter, and

irrigation water. Nutrient management is the practice of managing the amount, rate, source, method of application, and timing of plant nutrients and soil amendments. The timing and application of nutrients will correspond with plant uptake, soil properties and weather conditions. For more information on nutrient balance management see Draft EIS Section 3.5.3, and Draft EIS Appendix D.

The effluent storage ponds are sized to accommodate 30 days of storage for up to 2,000 mature dairy cows, and over 85 days of storage for 699 mature dairy cows. It will be highly unlikely that the storage pond will be full at any time for the contemplated 2,000-cow dairy, and nearly impossible for the committed 699-cow dairy. Throughout the less than 30-day storage period, effluent is planned for application every four days, and the slurry application is expected at least once every 45 days, to ensure that the ponds are kept at manageable levels.

Cows lactate milk following the birth of calves. Newborn calves will be housed on the Māhāʻulepū site and provided essential colostrum and nutrients for a healthy start. During the calves' initial 90 days, they will be transitioned to pasture at HDF before transfer to ranches on Kauaʻi to be raised off-site. The committed herd size of 699 mature dairy cows at the Māhāʻulepū site applies to mature mature dairy cows. Animals in various stages of lactation and rest will be transferred between HDF and other partner ranches as needed for animal health and dairy productivity. This will benefit both the dairy and infuse the beef market in Hawaiʻi with a new, local source of pasture-raised calves. Male calves will become part of the beef cattle herd; heifers (young female calves that haven't given birth) will be raised until ready to return to the HDF herd as a birthing/mature dairy cow. For more information on off-site herd management, refer to Section 3.7 of the Draft EIS.

Health of the herd is of primary importance as the success of a dairy relies on cows effectively producing quality milk. All cows will be treated with a high standard of care. Dairy managers and caretakers will be trained and competent in handling animals to minimize stress and ensure the herds' welfare. A licensed veterinarian may prescribe use of antibiotics approved by the Food & Drug Administration (FDA) for treatment of illnesses. Adherence to guidelines that prohibit milk from cows undergoing antibiotic treatment will ensure no adulteration of milk. Routine laboratory tests of milk for traces of antibiotic residue will be conducted. HDF will not inject cows with bovine growth hormone, referred to as rBST or rBGH.

PESTS: A study of invertebrate species and pest insects was conducted by Steven Lee Montgomery, PhD, Consulting Biologist in January 2016. The study summarizes the presence or absence of native species or pest species associated with cattle manure in the general Māhāʻulepū area, as well as the parasites and predators that control those species. No federally or state listed endangered or threatened invertebrate species were noted in the survey of the site. A full report and list of species found on site is provided in EIS Section 4.11 and Appendix B.

Flies were identified on the HDF site using manure from neighboring livestock as bait for invertebrates. The two flies associated with livestock are the stable fly and the horn fly, the latter known for biting cattle. These flies and the greenbottle fly are often confused with the house fly. Flies known to exist on Kauaʻi but not seen at the

HDF site include the house fly, the dog dung fly, and the chicken dung fly. These pests are common in areas with high pet populations. It is possible these fly species could inadvertently be brought to the dairy and utilize manure as a food source. HDF will prevent and control fly population growth through diligent clean up and sanitation practices regarding any trash and food waste, as well as through efficient manure composting practices. A full list of site management measures is provided in EIS Section 4.11. The project location does not provide any habitat for *drosophila musaphilia*, the only Kauaʻi species of native Hawaiian fly listed as Endangered or Threatened. Native Drosophila habitat is located many miles away in the high elevation koa-ʻōhiʻa forests.

Fly populations at HDF will be minimized through a process known as Integrated Pest Management (IPM). Essentially, IPM disrupts reproduction with appropriate means at key points in the pest's life cycle. Used in Hawaiʻi for decades, a number of invertebrates and a bird (the cattle egret) were introduced between 1898 and 1950 to reduce livestock-related insects. IPM utilizes knowledge of the ancient food web among species.

An especially important insect to minimize fly breeding habitat in manure is the dung beetle, which buries manure and incorporates it into the soil. Populations of dung beetles found on Kauaʻi and those species already in Māhāʻulepū Valley, will increase with the increased manure food source, thus increasing and speeding breakdown of manure. Dung beetles are specialists in the very important natural process of breaking up and quickly recycling bovine manure pads. The behavioral diversity among dung beetle species will work together to bury dung pats in one to three days, a shorter amount of time than the 10-30 days flies eggs need to hatch.

In the Kōloa-Poʻipū region, pest fly populations are dependent upon food and breeding sources nearby such as dog, cat, and chicken feces. Beef cattle graze in the region on agricultural lands along Ala Kinoiki Road between Kōloa and Poʻipū, and it is likely the livestock-related flies identified at the HDF site occur in this region as well. Localized controls to reduce pest populations need to address breeding sites in and amongst the food and animals wastes within the area. These mitigation measures will make it difficult for flies to breed, and BMPs will be enforced to address any increase in population, therefore it is expected that the dairy farm will not significantly affect recreational and resort areas.

DEMOGRAPHIC AND ECONOMIC: The potential impacts of Hawaiʻi Dairy Farms (HDF) to the existing economy were evaluated in the Draft Environmental Impact Statement (EIS), including a fiscal impact assessment report completed in April, 2016 by Plasch Economics Pacific. Draft EIS Section 4.15 addresses demographic and economic factors, with the complete report in Appendix J.

The HDF project would create short-term benefits through jobs for local construction personnel and local material suppliers. Such jobs would include equipment operators, cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, supervisors, painters, etc. Based on State employment multipliers, indirect employment related to Dairy construction would

be expected to average about 16 jobs on Kaua'i, and 8 on O'ahu. Construction employment would be expected to average about 12 jobs per year during the development period. Thus direct-plus-indirect employment association with construction would be expected to average approximately 36 jobs, of which 28 would be on Kaua'i.

The HDF project would contribute to diversification of Kaua'i's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Hawai'i Island), approximately10 percent of Hawai'i's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and indirect full-time equivalent jobs on Kaua'i, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on O'ahu.

HDF is expected to generate a net income of approximately $68,000 to the County when the 699 cow herd is established. When the dairy has matured to full production for the 699 cow dairy, net income to the State is calculated at $160,000 annually. With the potential contemplated herd size of up to 2,000 mature dairy cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be produced. This would double local milk production currently supplied by operational dairies on the Island of Hawai'i.

Additional employment generated by a possible expansion to accommodate the contemplated 2,000 mature dairy cow herd is estimated at approximately 3 construction jobs plus 4 indirect jobs on Kaua'i, and 2 indirect jobs on O'ahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an additional 5 full-time farm jobs would be added, with approximately 15 additional indirect jobs on Kaua'i and another 8 indirect jobs on O'ahu.

The dairy is expected to generate a net additional contribution to the County of approximately $8,000 for improvements related to expansion for the contemplated herd size of up to 2,000 mature dairy cows ($76,000 total versus $68,000 for the committed herd size). The State will derive approximately $360,000 annually in revenues from the contemplated 2,000-mature dairy cow dairy.

Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement

(EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhā'ulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhā'ulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Po'ipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhā'ulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawai'i Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD

produced by the on-site, existing Māhāʻulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhāʻulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhāʻulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kauaʻi community.

Regional Water Demand: The adjacent, developed Kōloa-Poʻipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kauaʻi will increase county-wide by 17,300 residents by 2030. The South Kauaʻi population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kauaʻi region (the Kōloa - Poʻipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhāʻulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhāʻulepū watershed.

The HDF site is located on the bottom-land of the upper Māhāʻulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Haʻupu

Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhāʻulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kauaʻi Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhāʻulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhāʻulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhāʻulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or

maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater

and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Poʻipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kauaʻi community.

AIR QUALITY: As a part of the Environmental Impact Statement (EIS), existing air quality conditions and project impacts were evaluated, including dust and odor. Potential odors and emission levels for air pollutants relevant to dairy operations were modeled, as currently there are no cows on site. EIS sections 4.19 and 4.25 provide an evaluation of air quality and odors, including a windrose depicting wind speed and direction in the area (see DEIS Section 4.1, Climate). The full air quality technical report can be found in Draft EIS Appendix I.

Clean Air Act

Under the *Clean Air Act of 1970* (CAA), amended November 1990, the U.S. Environmental Protection Agency (EPA) regulates both large and small sources of air pollutants by establishing National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. The State of Hawaiʻi has established its own *State Ambient Air Quality Standards* (SAAQS) that are as strict or, in some cases more strict than the

NAAQS. State standards prohibit any visible emissions of fugitive dust from construction activities at the property line.

Emissions relevant to livestock operation include particulate matter and fugitive dust. Greenhouse gases related to dairy cows include methane (CH_4) from enteric fermentation, and both methane and nitrous oxide (N_20) emissions from manure application. No State or Federal regulations for greenhouse gas emissions from farm operations or small businesses currently exist.

DUST

Dust will be generated as cows move along soft limestone walkways that connect the paddocks and lead to and from the milking parlor. Potential fugitive dust emission rates were estimated from published literature, where particulate matter (PM) is measurable from the "drylots" of confined dairy operations where animals walk over dirt and dried manure throughout the day.

Applying the emission rates from this available literature greatly overestimates potential emission resulting from HDF. Cows in the pastoral rotational-grazing system will be on pasture 22 hours each day and will spend two hours – in two separate milking cycles –moving to and from the barn for the 10- to 15-minute milking sessions.

Using atmospheric dispersion modeling system (AERMOD), the rates were scaled to the size of the non-pasture areas used by cows at HDF. Results were added to the background concentration of particulate matter (both PM_{10} and $PM_{2.5}$) measured on the island of Kaua'i, and the total concentration was compared to the State ambient air quality standards. Only the contemplated herd size of up to 2,000 mature dairy cows was modeled, as at the lower threshold of 699 cows, the potential fugitive dust impact would be negligible. The estimated concentration for PM_{10} is 2.01 $\mu g/m^3$, well below the State standard of 150 $\mu g/m^3$. The estimated concentration for $PM_{2.5}$ is 0.23 $\mu g/m^3$, well below the Federal standard of 35 $\mu g/m^3$ (see Draft EIS Section 4.19 and Table 4-19.2).

ODOR

Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF, so air dispersion models were used to determine potential odor levels. Local weather data was used in conjunction with the AERMOD modeling system, and published rates for manure odors emissions for dairy heifers and effluent ponds were adapted to reflect the HDF facilities.

Odor emission sources identified for modeling at HDF were manure in the pasture fields, irrigation water containing diluted nutrients from effluent, the effluent storage ponds, and the dairy buildings. Odor rates from published research were applied. Odor isopleths (a line used to map all points having the same numerical value) were created to display the model findings. Odor is described in "odor units" at the threshold of perception, which is defined by the point at which 50 percent of

panelists, in laboratory conditions, cannot smell the odor but 50 percent of the panelists can detect the odor.

Modeling results were generated for worst case meteorological conditions (low wind velocity / mixing). Generally, tradewinds will disperse odors to less than detectable levels beyond the HDF site; in periods of no wind, odor may not be dispersed creating the "worst case" scenario. In these periods without normal tradewind flow, the odor plume would extend to the south of the HDF site. Sections 4.19.2 and 4.25.2 of the EIS include graphics of the potential odor isopleths.

Results for the committed herd size of 699 mature dairy cows show that odors may be detectable by 50 percent of the sensitive population once per 200 hours, or 44 hours per year, within an area that extends approximately 1,670-feet (within one-third of a mile) beyond the dairy farm boundary, and does not reach recreational or residential areas. Results for the contemplated expanded herd size of up to 2,000 mature dairy cows show odors would not extend beyond 2,780 feet outside the HDF boundary (just over half a mile), again not reaching recreational or residential areas, and again with detection limited to 50 percent of the sensitive population approximately 44 hours per year. The parameters used in the analysis were intentionally conservative, and the impacts shown assume an unlikely confluence of worst-case meteorological data, irrigation location, and grazing location. Actual offsite odor impacts are likely to be much lower and/or less frequent than shown; it is likely odor detection beyond the HDF boundaries will be less frequent.

ALTERNATIVES: As a part of the DEIS, alternatives were evaluated that could attain the objectives of the action's purpose and need, and were compared with environmental benefits, costs, and risks of each reasonable alternative against those of the proposed dairy project. Further discussion of alternatives can be found in DEIS Section 6.

The DEIS evaluates alternatives that could attain the objectives of the action's purpose and need, and compares environmental benefits, costs, and risks of each reasonable alternative against those of the proposed action. Additionally, reasonable land use alternatives that emerged from public input during the project scoping phase are documented and briefly discussed. The alternatives that do not meet the project purpose are not advanced for analysis of environmental benefits, costs, and risks. The Environmental Impact Statement Rules, Hawai'i Administrative Rules Chapter 11-200 (HRS 11-200) requires a discussion of alternatives that could attain the objectives of the action, regardless of cost. There is no requirement for the alternatives analysis to consider every possible land use.

Four possible land uses that would not meet the project purpose are discussed. Rezoning the land for resort or residential development, or a potential conservation condemnation are two uses that were examined and eliminated from analysis. These options would not be reasonably viable given the existing private land tenure and existing zoning. Two additional alternatives were considered as reasonable land uses as they could be permitted within the existing State Land Use Agricultural District and County Agricultural Zoning District. These options include Agricultural Park with Processing Center, and development of an Agricultural Subdivision. The

alternatives were examined and eliminated from further analysis, however, as they would not fulfill the project purpose.

The analysis, therefore, focuses on alternatives that meet the project purpose. Rigorous exploration and evaluation of the environmental impacts of the alternatives, including those that might enhance environmental quality or avoid, reduce or minimize some or all of the adverse environmental effects, costs and risks. These alternatives include: (1) the development of a Conventional Feedlot Dairy (a non-pasture-based dairy) at the same location; (2) development of the Pasture-Based Dairy at an Alternative Location on Kaua'i; and (3) milk products processing by HDF. The alternative of "No Action" is also evaluated.

The alternatives analysis provides a comprehensive evaluation of the range of potential alternatives, including the two alternative development scenarios. Although the alternatives are potentially reasonable uses under existing zoning and neighboring uses, each fails to comprehensively fulfill the project requirements defined by the eight Project Objectives and the four established Evaluation Criteria (Chapter 2, Sections 2.3.3 and 2.3.4).

The essential differences as compared to the proposed action are highlighted in the following statements.

- Only one of the alternative actions (conventional feedlot alternative) would create a commercial scale dairy operation in Hawai'i, with the capability to produce 10 percent of the State's fresh milk demand thus reducing dependence on imported milk (Objective 1). This alternative, however, would not reduce reliance on costly imported fertilizer and feed (Objective 2); grow local, quality grass as a primary feedstock (Objective 3); and would not utilize 100 percent of manure on site as nutrients to grow forage for dairy cows (Criterion 4).
- None of the alternatives would secure a dairy location that meets the requirements for a pastoral, pasture-based grazing dairy: sufficient contiguous land area; available long-term land tenure; adequate potable water supply; suitable soil properties; gentle slope conditions; and accessibility (Criterion 1).
- One alternative (Agricultural Park) could potentially generate new long-term employment in the agricultural sector on Kaua'i in a wide range of positions including pasture agronomy/soils science, environmental resources management (Criterion 2).
- The Agricultural Park alternative could also develop sustainable food production utilizing Important Agricultural Lands, demonstrating the importance of long-term agricultural leases and capital investment for agricultural infrastructure, water systems and support facilities. (Criterion 3). However, after years of trying, it appears there was limited interest in such a venture.
- Finally, addressing the range of potential environmental impacts (natural, cultural, social and economic) (Objective 8) the two alternative development scenarios would generate fewer beneficial impacts and produce impacts that

could potentially exceed those anticipated from the proposed project.

In contrast to the other options considered, the planned agricultural operation of Hawai'i Dairy Farms, was determined to be the most viable option and is the preferred alternative. Of all the alternatives considered, this is the only approach that achieves project objectives and meets each of the four Evaluation Criteria.

- Hawai'i Dairy Farms will create a commercial scale pasture-based dairy operation in Hawai'i, with the capability to provide more than 1,000,000 gallons of the fresh milk demand, reducing dependence on imported milk (Objective 1).
- The planned dairy location meets the requirements of minimum land area, soil properties, slope conditions, water supply, land tenure and availability, and accessibility (Criterion 1).
- The planned action will generate new long-term employment in the agricultural sector on Kaua'i, including pasture agronomy/soils science, veterinary and animal husbandry, environmental resources management, milk/milk processing, and dairy business management (Criterion 2).
- Sustainable food production utilizing Important Agricultural Lands (Criterion 3) will occur with the proposed action, demonstrating the importance of long term agricultural leases, and the ability to draw capital investment for agricultural infrastructure including water systems and support facilities (Criterion 3).
- Address the range of potential environmental impacts by utilizing 100 percent of manure as natural fertilizer to grow the majority of food for cows (Criterion 4). The alternatives evaluated would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.
- Creating an economically viable pasture rotational-grazing model maintains agriculture, retains open space, and provides buffer between highly utilized resort and residential development and sensitive natural or cultural resources (Objective 8).

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI
Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

From: Carolyn Caylor <manager@poipukai.org>
Sent: Monday, February 23, 2015 4:55 PM
To: epo@doh.hawaii.gov; HDF
Subject: HDF Dairy

State of Hawaii, Department of Health
Environmental Planning Office
919 Ala Moana Blvd., Room 312
Honolulu, HI 96814
epo@doh.hawaii.gov

Group 70 International
Attn: HDF Project
925 Bethel St., 5th Floor
Honolulu, HI 96813
HDF@Group70int.com

Aloha,

COMMENTS ON HAWAI'I DAIRY FARM'S ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE, DATED JANUARY, 2015.

Why Mahaulepu?? Why not some other Grove Farm leased land? I have always been pro-agriculture. However, even all of you KNOW that this is the wrong place for a dairy. Please do not ignore this special place. Move the dairy to another area better suited for the impact. Not near the ocean, streams and ground waters.

The Mahaulepu area is popular for nature oriented activities and subsistence such as fishing, hiking, beach-going activities, bird watching and more. The EIS must address how these activities would be impacted by environmental effects from a large dairy of this size upstream of the beach-going area.Many children swim and wade in these waters and the last thing we want is another contaminated Black Pot beach or Kalapaki where bacteria levels are extremely high and there is no dairy in the vicinity.

The Koloa/Poipu area is home to approximately 3,000 residents, all of whom will be downwind of the dairy and thus affected by any airborne contaminants or odor. The area is also one of the top 3 visitor destinations, providing significant income to both County and State through property, TAT, general excise and other taxes. Environmental air, water and vector control concerns from the dairy would reduce property values and make the area less desirable to

visitors. The largest private employer for the island is within 2.5 miles of the proposed dairy and a thriving visitor industry encompasses the entire Koloa/Poipu area, a decrease in visitors to the area would adversely affect those employers thus causing loss of jobs and income for island residents. Reduced property values and visitors to the area would not only affect the local economy through loss of jobs/decreased incomes for residents, but reduced revenues for the State and County as well.

The above noted concerns should all be fully addressed by the EIS for Hawaii Dairy Farm's proposal at Mahaulepu Valley. Given the open, available, leasable land on the island, particularly that owned by lessor Grove Farm, this seems to be one of the most ill-suited locations for such an operation. Its proximity to freshwater sources, the ocean, nearby homes and businesses make this an extremely poor location for a dairy, especially given that all milk will have to be trucked to the port in Nawiliwili for shipment to Oahu for processing. The above noted environmental, health & social concerns in addition to this fact, render this a plan that will negatively impact the environment and economy of Kauai.

Thank you for carefully considering these concerns and your diligence in evaluating the impacts of this project in this area. Please choose another area, not Mahaulepu.Please!

Sincerely, Carolyn Caylor P. O. Box 1822 Koloa, HI 96756 808-346-0606

May 26, 2016

Carolyn Caylor
P.O. Box 1822
Koloa, HI 96756
manager@poipukai.org

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Carolyn Caylor:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

DAIRY OPERATIONS: Hawai'i Dairy Farms (HDF) will establish and operate a sustainable, pastoral rotational-grazing dairy farm in Māhā'ulepū Valley on the island of Kaua'i to produce fresh, locally available nutritious milk for Hawai'i families. The rotational-grazing method utilizes 100 percent of the cows' manure as natural fertilizer to grow pasture grass as a primary source of nutrition for dairy cows. This cost-effective method will reduce reliance on imported fertilizer and feed. Pasture grass will comprise at least 70 percent of the animals' diet. As a part of the Draft Environmental Impact Statement (EIS), the proposed facilities and operations for the dairy farm are described in Chapter 3.

The Environmental Impact Statement (EIS) Preparation Notice (EISPN), published January 23, 2015, described the proposed pasture-based rotational grazing system

as a "zero-discharge, grass-fed dairy". The term "zero-discharge" under the U.S. Environmental Protection Agency related to concentrated feeding operations (CAFO) is a system designed to not discharge pollutants into waters of the United States. As noted previously, the HDF system is designed to utilize 100 percent of the cows' manure on-site. However, nutrients would be introduced to the HDF site with any use; the Draft EIS identifies the amount of nutrients anticipated from the proposed dairy operations that could pass through to ground and surface waters. Therefore, HDF elected to discontinue use of the term "zero discharge" as it was construed as no nutrients into the system.

The term "grass-fed" was used in the HDF EISPN. This term was used to identify HDF's intent to utilize a locally-produced feedstock – grass – for more than 70 percent of the dairy herds' diet. In January 2016, the U.S. Department of Agricultural (USDA) Marketing Survey created a narrow legal definition of "grass-fed". The USDA standard defines what animals can and cannot be fed. The Food Alliance, a project of several northwest colleges, believes that when consumers choose grass-fed products there is an expectation that these will come from animals raised on pasture on a forage-based diet. Due to the evolving definition of "grass-fed", the term in not used in this EIS.

The dairy facilities will occupy an area of approximately 10 acres on the western boundary of the site. The developed area "footprint" will be less than 2 percent of the total farm area. Four buildings will be constructed to serve different functions, supported by utilities and infrastructure. Additional building information can be found in Draft EIS Section 3.3.1.

Agricultural infrastructure and utilities required for the dairy operations will include storage tanks and silos, effluent storage ponds, livestock water systems, and drainage improvements. The irrigation system and distribution of livestock water are discussed in Draft EIS Section 3.5, Pasture Management.

The pastoral rotational-grazing dairy provides a local feedstock – grass – as the herd's primary food source. Reducing imported feed stabilizes costs and provides a food source closer to the natural diet of cows. Results of grass trials initially conducted at five sites across four Hawaiian Islands were instrumental in identifying appropriate varieties of grass, and suitable sites to support sufficient "dry matter" grass yields essential to a cow's diet. Additional project-specific trials at the Māhā'ulepū site on Kauai have been conducted for more than 18 months. The results have identified sufficient yield and nutrition to supply 70 percent of the cows' diet; improvements in grass productivity are anticipated to provide up to 85 percent of cows' diet.

The pasture-based model allows cows to move about freely, and to lie down and rest, which is part of the digestion cycle. The animals are managed in social groups known as "mobs", mimicking the natural social order of bovines. Cows spend 22 hours of each 24-hour period foraging on pasture or resting, outdoors in natural light and fresh air. The gently sloped paddocks, walkways and races minimize the energy expended by the mature dairy cows as they graze or are transferred to and from the various paddocks and the mature dairy facility; surfaces of the walkways

and cow races are designed to provide a comfortable path under hoof. The management practices and pasture model applied by HDF maximizes grass as the cows' primary nutrition source and minimizes stress to the animals. Cows tend to be healthier and live longer, productive lives with access to fresh air, high quality feed, and exercise while they forage.

The 470 acres of pasture will be divided into paddocks averaging 3 to 5 acres in size. Smaller paddocks located near the dairy facility will be used as temporary pasture for cows or calves being moved on or off the farm. To protect the water quality of surface water and downstream areas, paddock fences are set back 35 feet from the edge of drainage ways throughout the site. Existing vegetation within the setbacks will be managed or restored to reduce erosion, improve stability of ditch banks, increase net carbon storage, and improve and maintain water quality.

The majority of the pastures will be irrigated with non-potable water and/or diluted effluent through either the pivot irrigation systems or through gun irrigators. Irrigation water supply is provided to the farm from Waita Reservoir, and will be filtered and pumped to the various irrigation components on the farm. The irrigation system is controlled using computer software and GPS receivers to allow very precise application of irrigation and/or diluted effluent on the pasture. The pivots can rotate and apply irrigation water and/or diluted effluent at different rates depending on the actual irrigation needs of the farm.

NRCS provides technical guidance on applying agricultural waste depending on the desired use of the waste. Reflected in the title of the livestock waste guidance for Hawai'i is the parenthetical inclusion of the word "nutrients." Where waste is utilized as a resource, it is being used for the constituent components that provide benefit.

The NRCS Conservation Practice Standard 590, Nutrient Management, applies to commercial fertilizers, organic by-products, waste water, organic matter, and irrigation water. Nutrient management is the practice of managing the amount, rate, source, method of application, and timing of plant nutrients and soil amendments. The timing and application of nutrients will correspond with plant uptake, soil properties and weather conditions. For more information on nutrient balance management see Draft EIS Section 3.5.3, and Draft EIS Appendix D.

The effluent storage ponds are sized to accommodate 30 days of storage for up to 2,000 mature dairy cows, and over 85 days of storage for 699 mature dairy cows. It will be highly unlikely that the storage pond will be full at any time for the contemplated 2,000-cow dairy, and nearly impossible for the committed 699-cow dairy. Throughout the less than 30-day storage period, effluent is planned for application every four days, and the slurry application is expected at least once every 45 days, to ensure that the ponds are kept at manageable levels.

Cows lactate milk following the birth of calves. Newborn calves will be housed on the Māhā'ulepū site and provided essential colostrum and nutrients for a healthy start. During the calves' initial 90 days, they will be transitioned to pasture at HDF before transfer to ranches on Kaua'i to be raised off-site. The committed herd size of

699 mature dairy cows at the Māhā'ulepū site applies to mature mature dairy cows. Animals in various stages of lactation and rest will be transferred between HDF and other partner ranches as needed for animal health and dairy productivity. This will benefit both the dairy and infuse the beef market in Hawai'i with a new, local source of pasture-raised calves. Male calves will become part of the beef cattle herd; heifers (young female calves that haven't given birth) will be raised until ready to return to the HDF herd as a birthing/mature dairy cow. For more information on off-site herd management, refer to Section 3.7 of the Draft EIS.

Health of the herd is of primary importance as the success of a dairy relies on cows effectively producing quality milk. All cows will be treated with a high standard of care. Dairy managers and caretakers will be trained and competent in handling animals to minimize stress and ensure the herds' welfare. A licensed veterinarian may prescribe use of antibiotics approved by the Food & Drug Administration (FDA) for treatment of illnesses. Adherence to guidelines that prohibit milk from cows undergoing antibiotic treatment will ensure no adulteration of milk. Routine laboratory tests of milk for traces of antibiotic residue will be conducted. HDF will not inject cows with bovine growth hormone, referred to as rBST or rBGH.

DEMOGRAPHIC AND ECONOMIC: The potential impacts of Hawai'i Dairy Farms (HDF) to the existing economy were evaluated in the Draft Environmental Impact Statement (EIS), including a fiscal impact assessment report completed in April, 2016 by Plasch Economics Pacific. Draft EIS Section 4.15 addresses demographic and economic factors, with the complete report in Appendix J.

The HDF project would create short-term benefits through jobs for local construction personnel and local material suppliers. Such jobs would include equipment operators, cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, supervisors, painters, etc. Based on State employment multipliers, indirect employment related to Dairy construction would be expected to average about 16 jobs on Kaua'i, and 8 on O'ahu. Construction employment would be expected to average about 12 jobs per year during the development period. Thus direct-plus-indirect employment association with construction would be expected to average approximately 36 jobs, of which 28 would be on Kaua'i.

The HDF project would contribute to diversification of Kaua'i's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Hawai'i Island), approximately10 percent of Hawai'i's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and indirect full-time equivalent jobs on Kaua'i, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on O'ahu.

HDF is expected to generate a net income of approximately $68,000 to the County when the 699 cow herd is established. When the dairy has matured to full

production for the 699 cow dairy, net income to the State is calculated at $160,000 annually. With the potential contemplated herd size of up to 2,000 mature dairy cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be produced. This would double local milk production currently supplied by operational dairies on the Island of Hawai'i.

Additional employment generated by a possible expansion to accommodate the contemplated 2,000 mature dairy cow herd is estimated at approximately 3 construction jobs plus 4 indirect jobs on Kaua'i, and 2 indirect jobs on O'ahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an additional 5 full-time farm jobs would be added, with approximately 15 additional indirect jobs on Kaua'i and another 8 indirect jobs on O'ahu.

The dairy is expected to generate a net additional contribution to the County of approximately $8,000 for improvements related to expansion for the contemplated herd size of up to 2,000 mature dairy cows ($76,000 total versus $68,000 for the committed herd size). The State will derive approximately $360,000 annually in revenues from the contemplated 2,000-mature dairy cow dairy.

Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhā'ulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick

alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhā'ulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Po'ipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhā'ulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawai'i Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhā'ulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhā'ulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhā'ulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kaua'i community.

Regional Water Demand: The adjacent, developed Kōloa-Po'ipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kaua'i will increase county-wide by 17,300 residents by 2030. The South Kaua'i population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kaua'i region (the Kōloa - Po'ipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhā'ulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhā'ulepū watershed.

The HDF site is located on the bottom-land of the upper Māhā'ulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Ha'upu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhā'ulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kaua'i Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhā'ulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhā'ulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhā'ulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain

the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Poʻipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean

water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kauaʻi community.

AIR QUALITY: As a part of the Environmental Impact Statement (EIS), existing air quality conditions and project impacts were evaluated, including dust and odor. Potential odors and emission levels for air pollutants relevant to dairy operations were modeled, as currently there are no cows on site. EIS sections 4.19 and 4.25 provide an evaluation of air quality and odors, including a windrose depicting wind speed and direction in the area (see DEIS Section 4.1, Climate). The full air quality technical report can be found in Draft EIS Appendix I.

Clean Air Act

Under the *Clean Air Act of 1970* (CAA), amended November 1990, the U.S. Environmental Protection Agency (EPA) regulates both large and small sources of air pollutants by establishing National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. The State of Hawaiʻi has established its own *State Ambient Air Quality Standards* (SAAQS) that are as strict or, in some cases more strict than the NAAQS. State standards prohibit any visible emissions of fugitive dust from construction activities at the property line.

Emissions relevant to livestock operation include particulate matter and fugitive dust. Greenhouse gases related to dairy cows include methane (CH_4) from enteric fermentation, and both methane and nitrous oxide (N_20) emissions from manure application. No State or Federal regulations for greenhouse gas emissions from farm operations or small businesses currently exist.

DUST

Dust will be generated as cows move along soft limestone walkways that connect the paddocks and lead to and from the milking parlor. Potential fugitive dust emission rates were estimated from published literature, where particulate matter (PM) is measurable from the "drylots" of confined dairy operations where animals walk over dirt and dried manure throughout the day.

Applying the emission rates from this available literature greatly overestimates potential emission resulting from HDF. Cows in the pastoral rotational-grazing

system will be on pasture 22 hours each day and will spend two hours – in two separate milking cycles –moving to and from the barn for the 10- to 15-minute milking sessions.

Using atmospheric dispersion modeling system (AERMOD), the rates were scaled to the size of the non-pasture areas used by cows at HDF. Results were added to the background concentration of particulate matter (both PM_{10} and $PM_{2.5}$) measured on the island of Kaua'i, and the total concentration was compared to the State ambient air quality standards. Only the contemplated herd size of up to 2,000 mature dairy cows was modeled, as at the lower threshold of 699 cows, the potential fugitive dust impact would be negligible. The estimated concentration for PM_{10} is 2.01 $\mu g/m^3$, well below the State standard of 150 $\mu g/m^3$. The estimated concentration for $PM_{2.5}$ is 0.23 $\mu g/m^3$, well below the Federal standard of 35 $\mu g/m^3$ (see Draft EIS Section 4.19 and Table 4-19.2).

ODOR

Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF, so air dispersion models were used to determine potential odor levels. Local weather data was used in conjunction with the AERMOD modeling system, and published rates for manure odors emissions for dairy heifers and effluent ponds were adapted to reflect the HDF facilities.

Odor emission sources identified for modeling at HDF were manure in the pasture fields, irrigation water containing diluted nutrients from effluent, the effluent storage ponds, and the dairy buildings. Odor rates from published research were applied. Odor isopleths (a line used to map all points having the same numerical value) were created to display the model findings. Odor is described in "odor units" at the threshold of perception, which is defined by the point at which 50 percent of panelists, in laboratory conditions, cannot smell the odor but 50 percent of the panelists can detect the odor.

Modeling results were generated for worst case meteorological conditions (low wind velocity / mixing). Generally, tradewinds will disperse odors to less than detectable levels beyond the HDF site; in periods of no wind, odor may not be dispersed creating the "worst case" scenario. In these periods without normal tradewind flow, the odor plume would extend to the south of the HDF site. Sections 4.19.2 and 4.25.2 of the EIS include graphics of the potential odor isopleths.

Results for the committed herd size of 699 mature dairy cows show that odors may be detectable by 50 percent of the sensitive population once per 200 hours, or 44 hours per year, within an area that extends approximately 1,670-feet (within one-third of a mile) beyond the dairy farm boundary, and does not reach recreational or residential areas. Results for the contemplated expanded herd size of up to 2,000 mature dairy cows show odors would not extend beyond 2,780 feet outside the HDF boundary (just over half a mile), again not reaching recreational or residential areas, and again with detection limited to 50 percent of the sensitive population approximately 44 hours per year. The parameters used in the analysis were

intentionally conservative, and the impacts shown assume an unlikely confluence of worst-case meteorological data, irrigation location, and grazing location. Actual offsite odor impacts are likely to be much lower and/or less frequent than shown; it is likely odor detection beyond the HDF boundaries will be less frequent.

ALTERNATIVES: As a part of the DEIS, alternatives were evaluated that could attain the objectives of the action's purpose and need, and were compared with environmental benefits, costs, and risks of each reasonable alternative against those of the proposed dairy project. Further discussion of alternatives can be found in DEIS Section 6.

The DEIS evaluates alternatives that could attain the objectives of the action's purpose and need, and compares environmental benefits, costs, and risks of each reasonable alternative against those of the proposed action. Additionally, reasonable land use alternatives that emerged from public input during the project scoping phase are documented and briefly discussed. The alternatives that do not meet the project purpose are not advanced for analysis of environmental benefits, costs, and risks. The Environmental Impact Statement Rules, Hawai'i Administrative Rules Chapter 11-200 (HRS 11-200) requires a discussion of alternatives that could attain the objectives of the action, regardless of cost. There is no requirement for the alternatives analysis to consider every possible land use.

Four possible land uses that would not meet the project purpose are discussed. Rezoning the land for resort or residential development, or a potential conservation condemnation are two uses that were examined and eliminated from analysis. These options would not be reasonably viable given the existing private land tenure and existing zoning. Two additional alternatives were considered as reasonable land uses as they could be permitted within the existing State Land Use Agricultural District and County Agricultural Zoning District. These options include Agricultural Park with Processing Center, and development of an Agricultural Subdivision. The alternatives were examined and eliminated from further analysis, however, as they would not fulfill the project purpose.

The analysis, therefore, focuses on alternatives that meet the project purpose. Rigorous exploration and evaluation of the environmental impacts of the alternatives, including those that might enhance environmental quality or avoid, reduce or minimize some or all of the adverse environmental effects, costs and risks. These alternatives include: (1) the development of a Conventional Feedlot Dairy (a non-pasture-based dairy) at the same location; (2) development of the Pasture-Based Dairy at an Alternative Location on Kaua'i; and (3) milk products processing by HDF. The alternative of "No Action" is also evaluated.

The alternatives analysis provides a comprehensive evaluation of the range of potential alternatives, including the two alternative development scenarios. Although the alternatives are potentially reasonable uses under existing zoning and neighboring uses, each fails to comprehensively fulfill the project requirements defined by the eight Project Objectives and the four established Evaluation Criteria (Chapter 2, Sections 2.3.3 and 2.3.4).

The essential differences as compared to the proposed action are highlighted in the following statements.

- Only one of the alternative actions (conventional feedlot alternative) would create a commercial scale dairy operation in Hawai'i, with the capability to produce 10 percent of the State's fresh milk demand thus reducing dependence on imported milk (Objective 1). This alternative, however, would not reduce reliance on costly imported fertilizer and feed (Objective 2); grow local, quality grass as a primary feedstock (Objective 3); and would not utilize 100 percent of manure on site as nutrients to grow forage for dairy cows (Criterion 4).
- None of the alternatives would secure a dairy location that meets the requirements for a pastoral, pasture-based grazing dairy: sufficient contiguous land area; available long-term land tenure; adequate potable water supply; suitable soil properties; gentle slope conditions; and accessibility (Criterion 1).
- One alternative (Agricultural Park) could potentially generate new long-term employment in the agricultural sector on Kaua'i in a wide range of positions including pasture agronomy/soils science, environmental resources management (Criterion 2).
- The Agricultural Park alternative could also develop sustainable food production utilizing Important Agricultural Lands, demonstrating the importance of long-term agricultural leases and capital investment for agricultural infrastructure, water systems and support facilities. (Criterion 3). However, after years of trying, it appears there was limited interest in such a venture.
- Finally, addressing the range of potential environmental impacts (natural, cultural, social and economic) (Objective 8) the two alternative development scenarios would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.

In contrast to the other options considered, the planned agricultural operation of Hawai'i Dairy Farms, was determined to be the most viable option and is the preferred alternative. Of all the alternatives considered, this is the only approach that achieves project objectives and meets each of the four Evaluation Criteria.

- Hawai'i Dairy Farms will create a commercial scale pasture-based dairy operation in Hawai'i, with the capability to provide more than 1,000,000 gallons of the fresh milk demand, reducing dependence on imported milk (Objective 1).
- The planned dairy location meets the requirements of minimum land area, soil properties, slope conditions, water supply, land tenure and availability, and accessibility (Criterion 1).
- The planned action will generate new long-term employment in the agricultural sector on Kaua'i, including pasture agronomy/soils science, veterinary and animal husbandry, environmental resources management, milk/milk processing, and dairy business management (Criterion 2).

- Sustainable food production utilizing Important Agricultural Lands (Criterion 3) will occur with the proposed action, demonstrating the importance of long term agricultural leases, and the ability to draw capital investment for agricultural infrastructure including water systems and support facilities (Criterion 3).
- Address the range of potential environmental impacts by utilizing 100 percent of manure as natural fertilizer to grow the majority of food for cows (Criterion 4). The alternatives evaluated would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.
- Creating an economically viable pasture rotational-grazing model maintains agriculture, retains open space, and provides buffer between highly utilized resort and residential development and sensitive natural or cultural resources (Objective 8).

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

Lee Cerioni <daystar@aloha.net> February 22, 2015 1:51 PM

To:
Jeff Overton / Group 70 International Inc

Hawaii Dairy Farm's Environenntal Impact statement

Dear Mr. Overton

I am writing you to express my concerns on the proposed dairy to be located in the Maha'ulepu' valley and the EIS statement that is to be prepared. I request that I be included in all EIS information as it is presented as I am greatly effected by the outcome..

First of all, Maha'ulepu is one of Hawaii's national treasures with geological &archeology wonders. It is the drainage basin for much of the south Kauai water supply.

To propose a 2000 head dairy farm based on the intense parameters of the New Zealand dairy models is a disaster. The NewZealand dairy models have been total failures with severe environmental damage. This is a fact not an opinion. The ground water around these dairies has been contaminated,the shoreline and ocean polluted and the people of NewZealand are still trying to deal with the outcome.

Second, the information provided by the Hawaii Dairy Farm (HDF) has been inaccurate as to soil types, distance to county water wells, and their ability to contain the enormous waste that will be a product of the dairy model.

Third, the Maha'ulepu valley already has a severe pollution problem concerning water runoff. The Waipouli stream which drains a large portion of western Maha'ulepu (and it is located directly down drainage from the proposed dairy) already has bacterial counts 100's of times over the EPA guidelines for clean water. There are many reports of people getting infections from crossing the stream and swimming in the ocean water at the mouth of this stream. I can no longer take my family hiking or swimming in this area without real concerns of contamination. This issue is not being addressed by the Dept. of Health. Can you imagine what the accidental waste spills of 2000 dairy cattle will do. It will be impossible not to have accidental waste coming from the dairy. If this dairy moves forward at this location, will the pollution issue ever be solved?

The EIS study is critical to the future of Mala'ulepu. The credibility and non biased scientific data to be presented is already in question as HDF has chosen the same research group who proposed this project to complete the EIS. The conflict of interest is obvious. This will require very close scrutiny to protect the public from environmental & health hazards, protections of our drinking water and use of our ocean resources

I am a registered voter in Hawaii and live on the south shore of Kauai. I request that I am presented all information as it becomes available through the EIS process. The community must have a voice in this process.

Mahalo for your time and consideration.

Lee Cerioni

Lee Cerioni
P.O.Box 1259
Koloa, HI. 96756

May 26, 2016

Lee Cerioni
P.O. Box 1259
Koloa, HI 96756
daystar@aloha.net

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Lee Cerioni:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

GROUP 70 OBJECTIVITY: Group 70 International, Inc. (Group 70) is responsible for the preparation and processing of the Hawai'i Dairy Farms Environmental Impact Statement (EIS). The EIS was prepared in accordance with the requirements of Chapter 343 Hawai'i Revised Statutes and the "Environmental Impact Statement Rules" (Chapter 200 of Title 11, Hawai'i Administrative Rules). The environmental planning team at Group 70 has prepared several hundred Environmental Assessment and EIS documents over the past 40 years, and every document has been accepted by the responsible County, State and Federal agency. On numerous past EIS projects, the Hawai'i Chapter of the American Planning Association has recognized Group 70's professional work with Chapter awards for excellence in environmental planning. Part of the EIS scoping process involves Group 70's

experienced team of technical sub consultants that are well-known and qualified in their respective fields of study. For this project, Group 70 is preparing the Hawai'i Dairy Farms EIS with the level of analysis required to properly evaluate and disclose the existing environmental conditions, probable impacts with mitigation, and potential cumulative and secondary effects.

DAIRY OPERATIONS: Hawai'i Dairy Farms (HDF) will establish and operate a sustainable, pastoral rotational-grazing dairy farm in Māhā'ulepū Valley on the island of Kaua'i to produce fresh, locally available nutritious milk for Hawai'i families. The rotational-grazing method utilizes 100 percent of the cows' manure as natural fertilizer to grow pasture grass as a primary source of nutrition for dairy cows. This cost-effective method will reduce reliance on imported fertilizer and feed. Pasture grass will comprise at least 70 percent of the animals' diet. As a part of the Draft Environmental Impact Statement (EIS), the proposed facilities and operations for the dairy farm are described in Chapter 3.

The Environmental Impact Statement (EIS) Preparation Notice (EISPN), published January 23, 2015, described the proposed pasture-based rotational grazing system as a "zero-discharge, grass-fed dairy". The term "zero-discharge" under the U.S. Environmental Protection Agency related to concentrated feeding operations (CAFO) is a system designed to not discharge pollutants into waters of the United States. As noted previously, the HDF system is designed to utilize 100 percent of the cows' manure on-site. However, nutrients would be introduced to the HDF site with any use; the Draft EIS identifies the amount of nutrients anticipated from the proposed dairy operations that could pass through to ground and surface waters. Therefore, HDF elected to discontinue use of the term "zero discharge" as it was construed as no nutrients into the system.

The term "grass-fed" was used in the HDF EISPN. This term was used to identify HDF's intent to utilize a locally-produced feedstock – grass – for more than 70 percent of the dairy herds' diet. In January 2016, the U.S. Department of Agricultural (USDA) Marketing Survey created a narrow legal definition of "grass-fed". The USDA standard defines what animals can and cannot be fed. The Food Alliance, a project of several northwest colleges, believes that when consumers choose grass-fed products there is an expectation that these will come from animals raised on pasture on a forage-based diet. Due to the evolving definition of "grass-fed", the term in not used in this EIS.

The dairy facilities will occupy an area of approximately 10 acres on the western boundary of the site. The developed area "footprint" will be less than 2 percent of the total farm area. Four buildings will be constructed to serve different functions, supported by utilities and infrastructure. Additional building information can be found in Draft EIS Section 3.3.1.

Agricultural infrastructure and utilities required for the dairy operations will include storage tanks and silos, effluent storage ponds, livestock water systems, and drainage improvements. The irrigation system and distribution of livestock water are discussed in Draft EIS Section 3.5, Pasture Management.

The pastoral rotational-grazing dairy provides a local feedstock – grass – as the herd's primary food source. Reducing imported feed stabilizes costs and provides a food source closer to the natural diet of cows. Results of grass trials initially conducted at five sites across four Hawaiian Islands were instrumental in identifying appropriate varieties of grass, and suitable sites to support sufficient "dry matter" grass yields essential to a cow's diet. Additional project-specific trials at the Māhāʻulepū site on Kauai have been conducted for more than 18 months. The results have identified sufficient yield and nutrition to supply 70 percent of the cows' diet; improvements in grass productivity are anticipated to provide up to 85 percent of cows' diet.

The pasture-based model allows cows to move about freely, and to lie down and rest, which is part of the digestion cycle. The animals are managed in social groups known as "mobs", mimicking the natural social order of bovines. Cows spend 22 hours of each 24-hour period foraging on pasture or resting, outdoors in natural light and fresh air. The gently sloped paddocks, walkways and races minimize the energy expended by the mature dairy cows as they graze or are transferred to and from the various paddocks and the mature dairy facility; surfaces of the walkways and cow races are designed to provide a comfortable path under hoof. The management practices and pasture model applied by HDF maximizes grass as the cows' primary nutrition source and minimizes stress to the animals. Cows tend to be healthier and live longer, productive lives with access to fresh air, high quality feed, and exercise while they forage.

The 470 acres of pasture will be divided into paddocks averaging 3 to 5 acres in size. Smaller paddocks located near the dairy facility will be used as temporary pasture for cows or calves being moved on or off the farm. To protect the water quality of surface water and downstream areas, paddock fences are set back 35 feet from the edge of drainage ways throughout the site. Existing vegetation within the setbacks will be managed or restored to reduce erosion, improve stability of ditch banks, increase net carbon storage, and improve and maintain water quality.

The majority of the pastures will be irrigated with non-potable water and/or diluted effluent through either the pivot irrigation systems or through gun irrigators. Irrigation water supply is provided to the farm from Waita Reservoir, and will be filtered and pumped to the various irrigation components on the farm. The irrigation system is controlled using computer software and GPS receivers to allow very precise application of irrigation and/or diluted effluent on the pasture. The pivots can rotate and apply irrigation water and/or diluted effluent at different rates depending on the actual irrigation needs of the farm.

NRCS provides technical guidance on applying agricultural waste depending on the desired use of the waste. Reflected in the title of the livestock waste guidance for Hawaiʻi is the parenthetical inclusion of the word "nutrients." Where waste is utilized as a resource, it is being used for the constituent components that provide benefit.

The NRCS Conservation Practice Standard 590, Nutrient Management, applies to commercial fertilizers, organic by-products, waste water, organic matter, and

irrigation water. Nutrient management is the practice of managing the amount, rate, source, method of application, and timing of plant nutrients and soil amendments. The timing and application of nutrients will correspond with plant uptake, soil properties and weather conditions. For more information on nutrient balance management see Draft EIS Section 3.5.3, and Draft EIS Appendix D.

The effluent storage ponds are sized to accommodate 30 days of storage for up to 2,000 mature dairy cows, and over 85 days of storage for 699 mature dairy cows. It will be highly unlikely that the storage pond will be full at any time for the contemplated 2,000-cow dairy, and nearly impossible for the committed 699-cow dairy. Throughout the less than 30-day storage period, effluent is planned for application every four days, and the slurry application is expected at least once every 45 days, to ensure that the ponds are kept at manageable levels.

Cows lactate milk following the birth of calves. Newborn calves will be housed on the Māhāʻulepū site and provided essential colostrum and nutrients for a healthy start. During the calves' initial 90 days, they will be transitioned to pasture at HDF before transfer to ranches on Kauaʻi to be raised off-site. The committed herd size of 699 mature dairy cows at the Māhāʻulepū site applies to mature mature dairy cows. Animals in various stages of lactation and rest will be transferred between HDF and other partner ranches as needed for animal health and dairy productivity. This will benefit both the dairy and infuse the beef market in Hawaiʻi with a new, local source of pasture-raised calves. Male calves will become part of the beef cattle herd; heifers (young female calves that haven't given birth) will be raised until ready to return to the HDF herd as a birthing/mature dairy cow. For more information on off-site herd management, refer to Section 3.7 of the Draft EIS.

Health of the herd is of primary importance as the success of a dairy relies on cows effectively producing quality milk. All cows will be treated with a high standard of care. Dairy managers and caretakers will be trained and competent in handling animals to minimize stress and ensure the herds' welfare. A licensed veterinarian may prescribe use of antibiotics approved by the Food & Drug Administration (FDA) for treatment of illnesses. Adherence to guidelines that prohibit milk from cows undergoing antibiotic treatment will ensure no adulteration of milk. Routine laboratory tests of milk for traces of antibiotic residue will be conducted. HDF will not inject cows with bovine growth hormone, referred to as rBST or rBGH.

SOILS: Soil is an ecosystem that can be managed to provide nutrients for plant growth, to absorb and hold rainwater for use during dryer periods, to filter and buffer potential pollutants from leaving fields, to serve as a firm foundation for agricultural activities, and to provide habitat for soil microbes to flourish and diversify to keep the ecosystem healthy. Two rounds of independent soil sampling were undertaken at HDF to understand and characterize available soil nutrients and conditions. Section 4.3 of the Environmental Impact Statement (EIS) characterizes soil conditions, and anticipated impacts from effluent and supplemental nutrient application. Recommendations from Dr. Russell Yost and Nicholas Krueger of the University of Hawaiʻi at Mānoa are summarized. Their baseline nutrient report is included as Appendix C of the Draft EIS.

Soil conservation is a core principal behind establishment of the NRCS, which was formed out of the Soil Conservation Service to acknowledge its expanded role in watershed-scale approach using science-based tools and standards in agronomy, engineering economics, wildlife biology and other disciplines to aid landowners in implementation of conservation practices. NRCS conservation practices are listed in Chapter 3, Section 3.2; these practices codes identify design and construction standards related to drainage, materials, operations and applicable engineering standards. HDF will follow the developed Conservation Plan, which was approved by the West Kaua'i Soil & Water Conservation District in December, 2013.

The United States Department of Agriculture (USDA) Natural Resources Conservation Services (NRCS) has mapped and classified soils for more than 95 percent of the United States. Comments received during the initial scoping for this EIS included a "Custom Soils Resource Report for Island of Kaua'i, Hawai'i." The report was generated from the USDA NRCS website, which allows any internet user to define an area of interest, customize data results, and generate a Custom Soil Resource Report. The user can select or deselect parameters based upon which data the user would like to display. These user-generated reports are not evaluated by NRCS.

The NRCS soils classifications and descriptions provide a good information base, however, in-field soils testing is needed to identify existing soil nutrient levels and conditions. The most abundant soil types at the HDF site are Kalihi Clay at 32 percent, Ka'ena Clay Brown Variant at 29 percent, and Lualualei Clay at roughly 14 percent of the dairy site. Laboratory analysis of soil samples collected in 2014 identified levels of pH, phosphorus, nitrogen, potassium, calcium, magnesium, organic matter, salinity, micronutrients and other constituents. The results illustrate that the soils are depleted of nutrients, which is typical for lands formerly used for sugarcane. The soil nutrient status and fertility demands of the primary crop, Kikuyu grass, were used to identify the quantities of nutrients required for productive grass growth. The soils data provide a baseline to guide adaptive nutrient management throughout establishment and maturity of the dairy.

A second round of field sampling was conducted in 2015, and focused on evaluation of soils characterized as "poorly drained", and established a quantitative baseline of soil salinity and sodicity to provide for future monitoring of soil health with application of manure effluent. Laboratory analysis determined electrical conductivity and exchangeable sodium percentage, in addition to nutrient levels of nitrogen phosphorus calcium, magnesium, and potassium.

Poorly drained is not an indication of low or poor infiltration. Infiltration refers to the ability of water to enter the soil surface, whereas "drainage" refers to the movement of water within or from the soil profile. Poorly drained soils typically have low hydraulic conductivity, or a slow rate of groundwater movement through the soil. This slow movement can create anaerobic conditions, which typically result in higher rates of denitrification. This is the conversion of potentially nitrates and nitrites to gaseous forms, which reduces the potential for impacts on waterbodies. In this way, "poorly drained" soils may represent less risk of nitrate and nitrite leaching to associated waterbodies than "well drained" soils (Yost, 2016).

As a result of reduced movement of water through the soil profile, the mobility of nutrients such as potassium and phosphorus is also reduced. Soil types at the HDF site are known to adsorb and retain large amounts of phosphorus. Under the NRCS phosphorus leaching index for Hawai'i soils, HDF soils show low risk for leaching. With low risk, phosphorus can be applied at rates greater than crop requirements if manure or other organic materials are used to supply nutrients.

The dairy's focus on robust and healthy grass growth will build organic matter in soils through use of manure as a natural fertilizer. Soil can incorporate carbon from the atmosphere, which benefits soil health. According to recent studies in the Soil Science Society of America Journal, the conversion of formerly tilled cropland to grazed pasture can drive substantial accumulation of organic carbons in soil, with a potential to offset up to one-third of the annual increase in atmospheric carbon dioxide. The potential soil organic matter and carbon dioxide sequestration benefits are likely greatest in highly degraded soils in warm subtropical climates, partly due to long pasture-growing seasons. Long-term soil impacts are anticipated to result in improvement to the physical, chemical, and biological condition of the soil.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhā'ulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhā'ulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of

soils in the adjacent Kōloa-Poʻipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhāʻulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawaiʻi Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhāʻulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhāʻulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhāʻulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kauaʻi community.

Regional Water Demand: The adjacent, developed Kōloa-Poʻipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kauaʻi will increase county-wide by 17,300 residents by 2030. The South Kauaʻi population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kauaʻi region (the Kōloa - Poʻipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhāʻulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhāʻulepū watershed.

The HDF site is located on the bottom-land of the upper Māhāʻulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Haʻupu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhāʻulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kauaʻi Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore

recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhāʻulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhāʻulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhāʻulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to

increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Poʻipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kaua'i community.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

From: David Collison [mailto:davidc@penshurstcl.com]
Sent: Monday, February 23, 2015 12:15 PM
To: EPO; McIntyre, Laura; bbell@gmail.com
Subject: Why Mahaulepu?

Attention Ms Laura McIntyre
State of Hawaii
Dept of Health
Environmental Planning Office

Please find attached my objections to the proposed HDF dairy farm at Maha'ulepu

Sincerely

David Collison

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Why Maha'ulepu?

I was born and raised on a New Zealand dairy farm in the Waikato area of the North Island. For the final few years on the property, I managed the total operation.

I am somewhat confused by the oft quoted statement "The New Zealand model" in regards to the proposed HDF diary operation at Maha'ulepu. Another well - known quotation is "the devil is in the details" and there seems from press releases to be a dearth of details I would consider relevant. I am not accusing the developer of ignorance but it appears they are convinced the residents of Poipu and Koloa have it in abundance.

New Zealand is approximately 1000 miles long and there is no doubt that it is possible to have a "town supply" diary farm supplying fresh milk from one end of New Zealand to the other – just as it is anywhere in the world, given enough money. However a successful grass fed dairy herd requires frequent light rain, well drained fertile soil and adequate sun without great extremes of temperature. There are only two main areas in New Zealand that qualify and this is the Waikato area around the city of Hamilton and the Taranaki area around the city of New Plymouth. These two areas are probably the most intense grass fed diary areas in the world. Forty years ago we milked a total of approximately 200 cows plus an average "dry stock" level of 60 heifers and selected calves – all on 163 acres. No stock feed of any type was imported on to this Waikato farm and I'm told these figures have improved since then. However this climate is ideal for growing nutrient rich grass – particularly clovers which replenish the nitrogen in the soil. These are also grasses that will not grow adequately in a tropical climate. The area is also well away from salt breezes which can burn these grasses and of course the farm consisted of gently rolling well drained soil.

To be successful the cows need to be highly efficient at converting grass to milk and modern cows are a product of many decades of scientific selective breeding largely employing artificial insemination . All this is in an environment, that has, due to the number of livestock involved, veterinary, research and other support of all types, second to none in the world.

So far, I see almost no parallels between New Zealand and the heavy, poorly drained clay soils close to the sea, at Maha'ulepu.

As stated, high producing dairy cows are very efficient at converting grass to milk. Much grass and many gallons of water are daily consumed at one end and waste in the form of manure and urine is ejected at the other. Twice a day many quarts of high quality milk are available at the cow's udder.

To get grass into the cow's three methods can be employed depending on the weather. (A) In fine weather the cows walk to and from the milking facility to the grass where it is processed through the cow.

(B) If there is a danger of causing too much mud the grass can be harvested with a forage harvester and brought to the cow's. (C) A combination of both A and B.

All this grass consumed unfortunately also transfers fertility from the soil and means must be employed to return as much manure as possible to the fields.

Given the density of livestock on what is potentially a very muddy area during long wet spells I would presume there will be adequate concrete "hard standing areas" as well as this obvious requirement around the milking facility. As has been pointed out from many previous letters there will be a large accumulation of manure and urine. During (A) 80% will be deposited on each field. There will still need to be a method to collect and regularly spread the balance accumulated around the milking facility.

During (B) this operation becomes a major exercise. And (C) of course would be something in between. Any such intensive dairy operation requires rotational grazing – that is where the cows are moved on a daily basis from one field to the next to allow grass to recover and be ready for the next cycle. If cows are allowed to create too much mud while in the field during very wet weather in such poor draining clay soils, grass will be slower to recuperate. After each grazing the deposited manure must also be spread (by tractor and chain harrows) so that accumulated deposits are not too deep for grass to grow through or the grass will die.

Given the money available the initial proposed stocking rate should be feasible but as I have tried to explain above the area is far from ideal. Additional stocking rates will of course only exacerbate the problems.

As a permanent resident of Poipu adjacent to the Hyatt I have major concerns.

1.Those of us who have been brought up around livestock are used to animal smells. Those whose lifestyles subject them to perhaps only vehicle exhaust fumes at worst and the scents of flowers and trees at best, will most likely find any smells emanating from the farm highly objectionable. To say there will be no smells irrespective of wind direction, is delusional .

2. If the cow manure is not spread while fresh the smell becomes much more pronounced and certainly objectionable to even those with less acute olfactory senses.

3. In the twenty five years I have resided in the area we have experienced heavy periods of rain at times that would almost certainly, despite all precautions, cause discharge of unacceptable pollutants into the ocean.

4. Items 1,2 and 3 will also certainly impact my property values and those of my neighbors as well as detrimentally affecting the tourist industry of the area which is of course one of the primary engines of Kauai's economy.

David Collison

Poipu

May 26, 2016

David H. V. Collison
P O Box 568
Koloa HI 96756
davidc@penshurstcl.com

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear David H. V. Collison:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

Your comments were received by the State of Hawai'i Department of Health Environmental Planning office. The Department of Health forwarded a copy of your comments to Group 70 International in order to be included in the Draft Environmental Impact Statement (EIS) analysis. This letter was prepared in response to your comments.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

DAIRY OPERATIONS: Hawai'i Dairy Farms (HDF) will establish and operate a sustainable, pastoral rotational-grazing dairy farm in Māhā'ulepū Valley on the island of Kaua'i to produce fresh, locally available nutritious milk for Hawai'i families. The rotational-grazing method utilizes 100 percent of the cows' manure as natural fertilizer to grow pasture grass as a primary source of nutrition for dairy cows. This cost-effective method will reduce reliance on imported fertilizer and

feed. Pasture grass will comprise at least 70 percent of the animals' diet. As a part of the Draft Environmental Impact Statement (EIS), the proposed facilities and operations for the dairy farm are described in Chapter 3.

The Environmental Impact Statement (EIS) Preparation Notice (EISPN), published January 23, 2015, described the proposed pasture-based rotational grazing system as a "zero-discharge, grass-fed dairy". The term "zero-discharge" under the U.S. Environmental Protection Agency related to concentrated feeding operations (CAFO) is a system designed to not discharge pollutants into waters of the United States. As noted previously, the HDF system is designed to utilize 100 percent of the cows' manure on-site. However, nutrients would be introduced to the HDF site with any use; the Draft EIS identifies the amount of nutrients anticipated from the proposed dairy operations that could pass through to ground and surface waters. Therefore, HDF elected to discontinue use of the term "zero discharge" as it was construed as no nutrients into the system.

The term "grass-fed" was used in the HDF EISPN. This term was used to identify HDF's intent to utilize a locally-produced feedstock – grass – for more than 70 percent of the dairy herds' diet. In January 2016, the U.S. Department of Agricultural (USDA) Marketing Survey created a narrow legal definition of "grass-fed". The USDA standard defines what animals can and cannot be fed. The Food Alliance, a project of several northwest colleges, believes that when consumers choose grass-fed products there is an expectation that these will come from animals raised on pasture on a forage-based diet. Due to the evolving definition of "grass-fed", the term in not used in this EIS.

The dairy facilities will occupy an area of approximately 10 acres on the western boundary of the site. The developed area "footprint" will be less than 2 percent of the total farm area. Four buildings will be constructed to serve different functions, supported by utilities and infrastructure. Additional building information can be found in Draft EIS Section 3.3.1.

Agricultural infrastructure and utilities required for the dairy operations will include storage tanks and silos, effluent storage ponds, livestock water systems, and drainage improvements. The irrigation system and distribution of livestock water are discussed in Draft EIS Section 3.5, Pasture Management.

The pastoral rotational-grazing dairy provides a local feedstock – grass – as the herd's primary food source. Reducing imported feed stabilizes costs and provides a food source closer to the natural diet of cows. Results of grass trials initially conducted at five sites across four Hawaiian Islands were instrumental in identifying appropriate varieties of grass, and suitable sites to support sufficient "dry matter" grass yields essential to a cow's diet. Additional project-specific trials at the Māhā'ulepū site on Kauai have been conducted for more than 18 months. The results have identified sufficient yield and nutrition to supply 70 percent of the cows' diet; improvements in grass productivity are anticipated to provide up to 85 percent of cows' diet.

The pasture-based model allows cows to move about freely, and to lie down and rest, which is part of the digestion cycle. The animals are managed in social groups known as "mobs", mimicking the natural social order of bovines. Cows spend 22 hours of each 24-hour period foraging on pasture or resting, outdoors in natural light and fresh air. The gently sloped paddocks, walkways and races minimize the energy expended by the mature dairy cows as they graze or are transferred to and from the various paddocks and the mature dairy facility; surfaces of the walkways and cow races are designed to provide a comfortable path under hoof. The management practices and pasture model applied by HDF maximizes grass as the cows' primary nutrition source and minimizes stress to the animals. Cows tend to be healthier and live longer, productive lives with access to fresh air, high quality feed, and exercise while they forage.

The 470 acres of pasture will be divided into paddocks averaging 3 to 5 acres in size. Smaller paddocks located near the dairy facility will be used as temporary pasture for cows or calves being moved on or off the farm. To protect the water quality of surface water and downstream areas, paddock fences are set back 35 feet from the edge of drainage ways throughout the site. Existing vegetation within the setbacks will be managed or restored to reduce erosion, improve stability of ditch banks, increase net carbon storage, and improve and maintain water quality.

The majority of the pastures will be irrigated with non-potable water and/or diluted effluent through either the pivot irrigation systems or through gun irrigators. Irrigation water supply is provided to the farm from Waita Reservoir, and will be filtered and pumped to the various irrigation components on the farm. The irrigation system is controlled using computer software and GPS receivers to allow very precise application of irrigation and/or diluted effluent on the pasture. The pivots can rotate and apply irrigation water and/or diluted effluent at different rates depending on the actual irrigation needs of the farm.

NRCS provides technical guidance on applying agricultural waste depending on the desired use of the waste. Reflected in the title of the livestock waste guidance for Hawai'i is the parenthetical inclusion of the word "nutrients." Where waste is utilized as a resource, it is being used for the constituent components that provide benefit.

The NRCS Conservation Practice Standard 590, Nutrient Management, applies to commercial fertilizers, organic by-products, waste water, organic matter, and irrigation water. Nutrient management is the practice of managing the amount, rate, source, method of application, and timing of plant nutrients and soil amendments. The timing and application of nutrients will correspond with plant uptake, soil properties and weather conditions. For more information on nutrient balance management see Draft EIS Section 3.5.3, and Draft EIS Appendix D.

The effluent storage ponds are sized to accommodate 30 days of storage for up to 2,000 mature dairy cows, and over 85 days of storage for 699 mature dairy cows. It will be highly unlikely that the storage pond will be full at any time for the contemplated 2,000-cow dairy, and nearly impossible for the committed 699-cow dairy. Throughout the less than 30-day storage period, effluent is planned for

application every four days, and the slurry application is expected at least once every 45 days, to ensure that the ponds are kept at manageable levels.

Cows lactate milk following the birth of calves. Newborn calves will be housed on the Māhā'ulepū site and provided essential colostrum and nutrients for a healthy start. During the calves' initial 90 days, they will be transitioned to pasture at HDF before transfer to ranches on Kaua'i to be raised off-site. The committed herd size of 699 mature dairy cows at the Māhā'ulepū site applies to mature mature dairy cows. Animals in various stages of lactation and rest will be transferred between HDF and other partner ranches as needed for animal health and dairy productivity. This will benefit both the dairy and infuse the beef market in Hawai'i with a new, local source of pasture-raised calves. Male calves will become part of the beef cattle herd; heifers (young female calves that haven't given birth) will be raised until ready to return to the HDF herd as a birthing/mature dairy cow. For more information on off-site herd management, refer to Section 3.7 of the Draft EIS.

Health of the herd is of primary importance as the success of a dairy relies on cows effectively producing quality milk. All cows will be treated with a high standard of care. Dairy managers and caretakers will be trained and competent in handling animals to minimize stress and ensure the herds' welfare. A licensed veterinarian may prescribe use of antibiotics approved by the Food & Drug Administration (FDA) for treatment of illnesses. Adherence to guidelines that prohibit milk from cows undergoing antibiotic treatment will ensure no adulteration of milk. Routine laboratory tests of milk for traces of antibiotic residue will be conducted. HDF will not inject cows with bovine growth hormone, referred to as rBST or rBGH.

SOILS: Soil is an ecosystem that can be managed to provide nutrients for plant growth, to absorb and hold rainwater for use during dryer periods, to filter and buffer potential pollutants from leaving fields, to serve as a firm foundation for agricultural activities, and to provide habitat for soil microbes to flourish and diversify to keep the ecosystem healthy. Two rounds of independent soil sampling were undertaken at HDF to understand and characterize available soil nutrients and conditions. Section 4.3 of the Environmental Impact Statement (EIS) characterizes soil conditions, and anticipated impacts from effluent and supplemental nutrient application. Recommendations from Dr. Russell Yost and Nicholas Krueger of the University of Hawai'i at Mānoa are summarized. Their baseline nutrient report is included as Appendix C of the Draft EIS.

Soil conservation is a core principal behind establishment of the NRCS, which was formed out of the Soil Conservation Service to acknowledge its expanded role in watershed-scale approach using science-based tools and standards in agronomy, engineering economics, wildlife biology and other disciplines to aid landowners in implementation of conservation practices. NRCS conservation practices are listed in Chapter 3, Section 3.2; these practices codes identify design and construction standards related to drainage, materials, operations and applicable engineering standards. HDF will follow the developed Conservation Plan, which was approved by the West Kaua'i Soil & Water Conservation District in December, 2013.

The United States Department of Agriculture (USDA) Natural Resources Conservation Services (NRCS) has mapped and classified soils for more than 95 percent of the United States. Comments received during the initial scoping for this EIS included a "Custom Soils Resource Report for Island of Kaua'i, Hawai'i." The report was generated from the USDA NRCS website, which allows any internet user to define an area of interest, customize data results, and generate a Custom Soil Resource Report. The user can select or deselect parameters based upon which data the user would like to display. These user-generated reports are not evaluated by NRCS.

The NRCS soils classifications and descriptions provide a good information base, however, in-field soils testing is needed to identify existing soil nutrient levels and conditions. The most abundant soil types at the HDF site are Kalihi Clay at 32 percent, Ka'ena Clay Brown Variant at 29 percent, and Lualualei Clay at roughly 14 percent of the dairy site. Laboratory analysis of soil samples collected in 2014 identified levels of pH, phosphorus, nitrogen, potassium, calcium, magnesium, organic matter, salinity, micronutrients and other constituents. The results illustrate that the soils are depleted of nutrients, which is typical for lands formerly used for sugarcane. The soil nutrient status and fertility demands of the primary crop, Kikuyu grass, were used to identify the quantities of nutrients required for productive grass growth. The soils data provide a baseline to guide adaptive nutrient management throughout establishment and maturity of the dairy.

A second round of field sampling was conducted in 2015, and focused on evaluation of soils characterized as "poorly drained", and established a quantitative baseline of soil salinity and sodicity to provide for future monitoring of soil health with application of manure effluent. Laboratory analysis determined electrical conductivity and exchangeable sodium percentage, in addition to nutrient levels of nitrogen phosphorus calcium, magnesium, and potassium.

Poorly drained is not an indication of low or poor infiltration. Infiltration refers to the ability of water to enter the soil surface, whereas "drainage" refers to the movement of water within or from the soil profile. Poorly drained soils typically have low hydraulic conductivity, or a slow rate of groundwater movement through the soil. This slow movement can create anaerobic conditions, which typically result in higher rates of denitrification. This is the conversion of potentially nitrates and nitrites to gaseous forms, which reduces the potential for impacts on waterbodies. In this way, "poorly drained" soils may represent less risk of nitrate and nitrite leaching to associated waterbodies than "well drained" soils (Yost, 2016).

As a result of reduced movement of water through the soil profile, the mobility of nutrients such as potassium and phosphorus is also reduced. Soil types at the HDF site are known to adsorb and retain large amounts of phosphorus. Under the NRCS phosphorus leaching index for Hawai'i soils, HDF soils show low risk for leaching. With low risk, phosphorus can be applied at rates greater than crop requirements if manure or other organic materials are used to supply nutrients.

The dairy's focus on robust and healthy grass growth will build organic matter in soils through use of manure as a natural fertilizer. Soil can incorporate carbon from

the atmosphere, which benefits soil health. According to recent studies in the Soil Science Society of America Journal, the conversion of formerly tilled cropland to grazed pasture can drive substantial accumulation of organic carbons in soil, with a potential to offset up to one-third of the annual increase in atmospheric carbon dioxide. The potential soil organic matter and carbon dioxide sequestration benefits are likely greatest in highly degraded soils in warm subtropical climates, partly due to long pasture-growing seasons. Long-term soil impacts are anticipated to result in improvement to the physical, chemical, and biological condition of the soil.

NATURAL HAZARDS: The potential impacts of natural hazards are evaluated in the Draft Environmental Impact Statement (EIS), including flooding, tsunami, earthquakes, and hurricanes. Draft EIS Section 4.6 addresses natural hazards.

The Māhā'ulepū property is not known to experience flooding conditions. The area is located within Federal Emergency Management Agency (FEMA) Zone X, areas determined to be outside the 0.2% annual chance floodplain. The proposed location for Hawai'i Dairy Farms (HDF) lies between the 60 and 150 feet elevation, outside the tsunami evacuation zone. The Kaua'i and Ni'ihau region of the Hawaiian Islands has experienced tremors from earthquakes originating further south in the island chain, but no known seismic activity has originated among these northern islands.

Although they occur infrequently, Kaua'i has received a greater amount of damage from hurricanes when compared to the other Hawaiian Islands. Land management personnel in the Māhā'ulepū region during and following the hurricanes that affected Kaua'i in 1982 and 1992 observed defoliation of vegetation, and no flooding events in the period following passage of the storms.

Preparedness is the best protection for natural disasters. Structural design of dairy facilities will meet International Building Code (IBC) 2006 standards with local amendments. Provisions in design will address wind loading (including hurricane gusts), rain and flood loading, and earthquake loading. A geotechnical evaluation of the area recommended Seismic Site Class D under IBC standards be utilized for foundation design where the barns and agricultural infrastructure will be constructed.

There has been no rainfall event that would exceed the capacity of the effluent ponds since rainfall has been recorded in Māhā'ulepū Valley. The effluent pond capacity has been designed above the regulatory requirement to contain the 25-year, 24-hour rainfall event. An emergency containment berm with additional capacity for another 30 days is included in the design. This design exceeds regulatory requirements, with containment in excess of the major rainfall events recorded on Kaua'i over the past three decades.

An emergency preparedness plan for protection of animals has been prepared for HDF internal use that addresses hurricane, fire, and potential flooding hazard scenarios. HDF is not in a tsunami inundation area, so this scenario is not planned for in the disaster plan. The disaster plan relies upon knowledge of cow behavior, and is based on extensive guidance for livestock protection from NRCS, the Florida State Agricultural Response Team (SART), Pennsylvania State College of Agricultural

Sciences, and Cornell University Cooperative Extension. The plan includes safety procedures during any disaster, follow up actions, and emergency contacts for assistance before, during or following the event. Further information is provided in the Draft EIS Section 4.6.2.

DEMOGRAPHIC AND ECONOMIC: The potential impacts of Hawai'i Dairy Farms (HDF) to the existing economy were evaluated in the Draft Environmental Impact Statement (EIS), including a fiscal impact assessment report completed in April, 2016 by Plasch Economics Pacific. Draft EIS Section 4.15 addresses demographic and economic factors, with the complete report in Appendix J.

The HDF project would create short-term benefits through jobs for local construction personnel and local material suppliers. Such jobs would include equipment operators, cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, supervisors, painters, etc. Based on State employment multipliers, indirect employment related to Dairy construction would be expected to average about 16 jobs on Kaua'i, and 8 on O'ahu. Construction employment would be expected to average about 12 jobs per year during the development period. Thus direct-plus-indirect employment association with construction would be expected to average approximately 36 jobs, of which 28 would be on Kaua'i.

The HDF project would contribute to diversification of Kaua'i's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Hawai'i Island), approximately10 percent of Hawai'i's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and indirect full-time equivalent jobs on Kaua'i, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on O'ahu.

HDF is expected to generate a net income of approximately $68,000 to the County when the 699 cow herd is established. When the dairy has matured to full production for the 699 cow dairy, net income to the State is calculated at $160,000 annually. With the potential contemplated herd size of up to 2,000 mature dairy cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be produced. This would double local milk production currently supplied by operational dairies on the Island of Hawai'i.

Additional employment generated by a possible expansion to accommodate the contemplated 2,000 mature dairy cow herd is estimated at approximately 3 construction jobs plus 4 indirect jobs on Kaua'i, and 2 indirect jobs on O'ahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an additional 5 full-time farm jobs would be added, with approximately 15 additional indirect jobs on Kaua'i and another 8 indirect jobs on O'ahu.

The dairy is expected to generate a net additional contribution to the County of

approximately $8,000 for improvements related to expansion for the contemplated herd size of up to 2,000 mature dairy cows ($76,000 total versus $68,000 for the committed herd size). The State will derive approximately $360,000 annually in revenues from the contemplated 2,000-mature dairy cow dairy.

Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

ALTERNATIVES: As a part of the DEIS, alternatives were evaluated that could attain the objectives of the action's purpose and need, and were compared with environmental benefits, costs, and risks of each reasonable alternative against those of the proposed dairy project. Further discussion of alternatives can be found in DEIS Section 6.

The DEIS evaluates alternatives that could attain the objectives of the action's purpose and need, and compares environmental benefits, costs, and risks of each reasonable alternative against those of the proposed action. Additionally, reasonable land use alternatives that emerged from public input during the project scoping phase are documented and briefly discussed. The alternatives that do not meet the project purpose are not advanced for analysis of environmental benefits, costs, and risks. The Environmental Impact Statement Rules, Hawai'i Administrative Rules Chapter 11-200 (HRS 11-200) requires a discussion of alternatives that could attain the objectives of the action, regardless of cost. There is no requirement for the alternatives analysis to consider every possible land use.

Four possible land uses that would not meet the project purpose are discussed. Rezoning the land for resort or residential development, or a potential conservation condemnation are two uses that were examined and eliminated from analysis. These options would not be reasonably viable given the existing private land tenure and existing zoning. Two additional alternatives were considered as reasonable land uses as they could be permitted within the existing State Land Use Agricultural District and County Agricultural Zoning District. These options include Agricultural Park with Processing Center, and development of an Agricultural Subdivision. The alternatives were examined and eliminated from further analysis, however, as they would not fulfill the project purpose.

The analysis, therefore, focuses on alternatives that meet the project purpose. Rigorous exploration and evaluation of the environmental impacts of the alternatives, including those that might enhance environmental quality or avoid, reduce or minimize some or all of the adverse environmental effects, costs and risks. These alternatives include: (1) the development of a Conventional Feedlot Dairy (a non-pasture-based dairy) at the same location; (2) development of the Pasture-Based Dairy at an Alternative Location on Kaua'i; and (3) milk products processing by HDF. The alternative of "No Action" is also evaluated.

The alternatives analysis provides a comprehensive evaluation of the range of potential alternatives, including the two alternative development scenarios. Although the alternatives are potentially reasonable uses under existing zoning and neighboring uses, each fails to comprehensively fulfill the project requirements defined by the eight Project Objectives and the four established Evaluation Criteria (Chapter 2, Sections 2.3.3 and 2.3.4).

The essential differences as compared to the proposed action are highlighted in the following statements.

- Only one of the alternative actions (conventional feedlot alternative) would create a commercial scale dairy operation in Hawai'i, with the capability to produce 10 percent of the State's fresh milk demand thus reducing dependence on imported milk (Objective 1). This alternative, however, would not reduce reliance on costly imported fertilizer and feed (Objective 2); grow local, quality grass as a primary feedstock (Objective 3); and would not utilize 100 percent of manure on site as nutrients to grow forage for dairy cows (Criterion 4).
- None of the alternatives would secure a dairy location that meets the requirements for a pastoral, pasture-based grazing dairy: sufficient contiguous land area; available long-term land tenure; adequate potable water supply; suitable soil properties; gentle slope conditions; and accessibility (Criterion 1).
- One alternative (Agricultural Park) could potentially generate new long-term employment in the agricultural sector on Kaua'i in a wide range of positions including pasture agronomy/soils science, environmental resources management (Criterion 2).
- The Agricultural Park alternative could also develop sustainable food production utilizing Important Agricultural Lands, demonstrating the importance of long-term agricultural leases and capital investment for agricultural infrastructure, water systems and support facilities. (Criterion 3). However, after years of trying, it appears there was limited interest in such a venture.
- Finally, addressing the range of potential environmental impacts (natural, cultural, social and economic) (Objective 8) the two alternative development scenarios would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.

In contrast to the other options considered, the planned agricultural operation of Hawai'i Dairy Farms, was determined to be the most viable option and is the preferred alternative. Of all the alternatives considered, this is the only approach that achieves project objectives and meets each of the four Evaluation Criteria.

- Hawai'i Dairy Farms will create a commercial scale pasture-based dairy operation in Hawai'i, with the capability to provide more than 1,000,000 gallons of the fresh milk demand, reducing dependence on imported milk (Objective 1).
- The planned dairy location meets the requirements of minimum land area,

soil properties, slope conditions, water supply, land tenure and availability, and accessibility (Criterion 1).
- The planned action will generate new long-term employment in the agricultural sector on Kaua'i, including pasture agronomy/soils science, veterinary and animal husbandry, environmental resources management, milk/milk processing, and dairy business management (Criterion 2).
- Sustainable food production utilizing Important Agricultural Lands (Criterion 3) will occur with the proposed action, demonstrating the importance of long term agricultural leases, and the ability to draw capital investment for agricultural infrastructure including water systems and support facilities (Criterion 3).
- Address the range of potential environmental impacts by utilizing 100 percent of manure as natural fertilizer to grow the majority of food for cows (Criterion 4). The alternatives evaluated would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.
- Creating an economically viable pasture rotational-grazing model maintains agriculture, retains open space, and provides buffer between highly utilized resort and residential development and sensitive natural or cultural resources (Objective 8).

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

MICHAEL COON, M. Sc. (marine biology), B. Sc. (zoolology)

548 Beach Drive, Victoria, British Columbia, Canada V8S 2M5

Phone: 250-598-0640; Fax: 250-598-3855; Email: michaelandjenica@gmail.com

February 23, 2015

Via Registered Mail, Return Receipt Requested:

Laura McIntyre, State of Hawaii

Department of Health

1250 Punchbowl Street

Honolulu, HI, USA 96813

Group 70 International, Inc.

925 Bethel Street, 5th Floor

Honolulu, HI, USA 96813

Jeff Overton, Hawai'i Dairy Farms, LLC

PO Box 1690

Koloa, HI, USA 96756-1690

RE: COMMENTS ON HAWAI'I DAIRY FARM'S ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE, DATED JANUARY, 2015

Dear Ms. McIntyre,

I am a Canadian Marine Biologist who, along with my wife Jenica K. Waymen, has spent that past nine winters on Kauai. For the past six winters we have lived in Poipu , and during this time have come to regard Maha'ulepu as our favorite area for hiking, picnicking, snorkelling, underwater photography, and otherwise enjoying this undeveloped and wonderful ly natural area.

.../2

We are members of the Friends of Maha'ulepu (FOM) and my comments herein should be viewed as additional to those forwarded to you from the Law Offices of Charles M. Tebbutt, P.C., on behalf of FOM, dated February 23, 2015.

The Proposed Dairy Would Contaminate Surface and Ground Waters, Detrimentally Impacting the nearby Coastal and Marine Environments and Ecosystems

My comments will focus on the highly probable negative impacts of nutrients derived from the dairy cattle that Hawai'i Dairy Farms (HDF) propose to maintain in the Maha'ulepu watershed on the plants and animals of the intertidal and nearshore marine waters and seabed that will receive freshwater runoff from the proposed dairy farm site.

I have read the Hawai'i Dairy Farms Environmental Impact Statement Preparation Notice. The EIS Preparation Notice makes no mention of planned analyses of how manure/urine contaminated

(a) fresh surface water will impact the coastline or the nearshore coast marine environment near and down current of the point at which Waiopili Stream discharges into the sea near Gillin's Cottage, or

(b) groundwater which may flow or leach into the Maha'ulepu seafront over a broader area.

The EIS must fully address these highly probable impacts, including a careful examination of the effects of each manure and urine component on the shoreline and nearshore marine environments.

The scientific literature includes many published studies of the impacts of land-based nutrients on shoreline and nearshore marine life – both plant and animal. Of particular concern in the Maha'ulepu area are the corals which are already under increased stress from ocean warming and acidification and well known to be highly susceptible to being killed by certain marine algae which thrive when land-based nutrients are made available. When the corals are killed, the whole ecosystem is radically changed.

Tropical seas, like that off the Maha'ulepu shoreline, are generally very nutrient poor and the associations of plants and animals that have evolved there are very efficient at recycling the available nutrients. However, they are severely and negatively impacted when unusual concentrations of nutrients become available.

Thus, the EIS must identify (a) the full range of possible impacts of manure/urine on the shoreline and nearshore marine plant and animal communities, (b) ways to prevent these impacts, and (c) responses which will be made should the prevention approaches not be effective.

Michael C

Michael Coon, M. Sc.

May 26, 2016

Michael M. Coon
548 Beach Drive
Victoria, BC Canada V8S 2M5
michaelandjenica@gmail.com

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Michael M. Coon:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

FLORA AND FAUNA: Botanical, avian, and mammalian surveys of the property were conducted for the Draft Environmental Impact Statement (EIS) to assess existing species on site, including identifying any species listed as endangered, threatened, or proposed under any state or federal endangered species programs in or near the property. EIS Sections 4.9 and 4.10 address the evaluation of flora and fauna resources, with technical studies in Appendix A and B.

A botanical survey of the dairy property was conducted in August 2014 by AECOS Consulting to assess existing plant species. The survey also investigated for the presence of plants currently listed as endangered, threatened or proposed for listing under Federal or the State of Hawai'i's endangered species programs, located onsite or within the immediate vicinity of the dairy site. The nature of the land and its

present and historical uses for intensive agriculture very much limit the natural botanical resources anticipated to occur on this land. Complete species lists are included in the EIS, and no protected botanical species occur on the project property. The project will include vegetated buffer strips along the drainage ways as part of the Conservation Plan to reduce erosion and stabilize slopes. Where native plants occur or could survive if planted, native plants will be used in the stabilization. No long-term impacts to native plant habitats or endangered or threatened plants species will occur as a result of the dairy.

Avian and mammalian surveys were conducted in August 2014 by Rana Biological Consulting, Inc. This survey was conducted to assess the potential presence of avian or mammalian species currently listed as endangered, threatened or proposed for listing under either Federal or the State endangered species lists. The survey covered the dairy site area and immediate vicinity. Common birds and terrestrial mammals were encountered on the property. There is no critical habitat for endangered species in the upper Māhā'ulepū Valley.

Four species of endangered waterbirds were recorded on the site and at the nearby taro farm located within the HDF site. Though the area does not provide critical habitat, seabirds that nest in upland areas of Kauai may overfly the site. The endangered Hawaiian goose, nēnē was also seen on the site. State Division of Forestry and Wildlife biologists have noted nēnē are regularly seen on the subject property. It is probable that some nest on or adjacent to the site as this species nests in the general Kōloa area, and the habitat present on parts of the site is suitable for nēnē nesting.

The principal potential impacts posed to the five endangered species include those potentially associated with construction activities, and those associated with dairy farm operations following build-out. Measures will be adopted to avoid potential seabird and nēnē goose collisions with fences and structures. Potential measures include lowering construction cranes at night, using conservation fencing to project-specified areas, marking tall structures and fencing with white visibility polytape, limiting nighttime lighting, and shading any outside lights used at night. Ongoing mitigation strategies will be implemented for day-to-day preventative measures, including an Avian Species Protection Plan. Mitigation measures are further described in DEIS Section 4.10.2.

It is also likely that Hawaiian hoary bats overfly the project area on a seasonal basis. While caution will be taken during any potential disturbance or vegetation removal, there are almost no suitable roost trees within the dairy site, thus it is expected that the dairy farm will not affect this listed mammalian species.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhāʻulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhāʻulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Poʻipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhāʻulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawaiʻi Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhāʻulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhāʻulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhāʻulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kauaʻi community.

Regional Water Demand: The adjacent, developed Kōloa-Poʻipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kauaʻi will increase county-wide by 17,300 residents by 2030. The South Kauaʻi population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kauaʻi region (the Kōloa - Poʻipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhāʻulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhāʻulepū watershed.

The HDF site is located on the bottom-land of the upper Māhāʻulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Haʻupu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhāʻulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kaua'i Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhā'ulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhā'ulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhā'ulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top

of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhā'ulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Po'ipū region were also calculated. Nitrogen input to the marine environment in the Po'ipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Po'ipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kaua'i community.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

Hawai'i Dairy Farms
MAHA'ULEPU, KAUA'I

RECEIVED
FEB 23 2015
GROUP 70 INTL

ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE

An Environmental Impact Statement (EIS) is being prepared voluntarily by the Applicant to assess potential environmental impacts and mitigation measures associated with agricultural operations at Hawai'i Dairy Farms (HDF) at Māhā'ulepū, Kaua'i.

To assist in preparing the EIS, an Environmental Impact Statement Preparation Notice (EISPN) was recently published. A 30-day public comment period on the EISPN ends February 23, 2015. The purposes of the publication and comment period are two-fold:

1. to allow individuals and groups to request to become a consulted party; and
2. to provide written comment regarding effects of the proposed action.

NOTE: Submitted comments will be published in the Draft EIS

COMMENT

Name: Felicia Cowden Organization:

Preferred contact Method

Email: akamaimom@gmail.com Postal Address: 4191 Kilauea Road Kilauea, HI 96754

Phone: (Optional) 652-4363

Comments: There are 6 questions on the back of this. Number 7 is here

7.) What is our measure of anticipated odor?
- How do we know when a level is consider too much?

- Is an alternative pasture designated to lighten the density if either "odor" or the water pollution levels become high?

8. What are the damage mitigation strategies if the well water becomes contaminated?
- Is there a possible bond that could be strutured to cover potential costs?

Return to:
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Attn: HDF Project
Honolulu, HI 96813
hdf@group70int.com

And/or:
Hawaii State Department of Health
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919 Ala Moana Boulevard, Rm. 312
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epo@doh.hawaii.gov

Deadline: February 23, 2015

May 26, 2016

Felicia Cowden
4191 Kilauea Road
Kilauea, HI 96754
akamaimom@gmail.com

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Felicia Cowden:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

DAIRY OPERATIONS: Hawai'i Dairy Farms (HDF) will establish and operate a sustainable, pastoral rotational-grazing dairy farm in Māhā'ulepū Valley on the island of Kaua'i to produce fresh, locally available nutritious milk for Hawai'i families. The rotational-grazing method utilizes 100 percent of the cows' manure as natural fertilizer to grow pasture grass as a primary source of nutrition for dairy cows. This cost-effective method will reduce reliance on imported fertilizer and feed. Pasture grass will comprise at least 70 percent of the animals' diet. As a part of the Draft Environmental Impact Statement (EIS), the proposed facilities and operations for the dairy farm are described in Chapter 3.

The Environmental Impact Statement (EIS) Preparation Notice (EISPN), published January 23, 2015, described the proposed pasture-based rotational grazing system

as a "zero-discharge, grass-fed dairy". The term "zero-discharge" under the U.S. Environmental Protection Agency related to concentrated feeding operations (CAFO) is a system designed to not discharge pollutants into waters of the United States. As noted previously, the HDF system is designed to utilize 100 percent of the cows' manure on-site. However, nutrients would be introduced to the HDF site with any use; the Draft EIS identifies the amount of nutrients anticipated from the proposed dairy operations that could pass through to ground and surface waters. Therefore, HDF elected to discontinue use of the term "zero discharge" as it was construed as no nutrients into the system.

The term "grass-fed" was used in the HDF EISPN. This term was used to identify HDF's intent to utilize a locally-produced feedstock – grass – for more than 70 percent of the dairy herds' diet. In January 2016, the U.S. Department of Agricultural (USDA) Marketing Survey created a narrow legal definition of "grass-fed". The USDA standard defines what animals can and cannot be fed. The Food Alliance, a project of several northwest colleges, believes that when consumers choose grass-fed products there is an expectation that these will come from animals raised on pasture on a forage-based diet. Due to the evolving definition of "grass-fed", the term in not used in this EIS.

The dairy facilities will occupy an area of approximately 10 acres on the western boundary of the site. The developed area "footprint" will be less than 2 percent of the total farm area. Four buildings will be constructed to serve different functions, supported by utilities and infrastructure. Additional building information can be found in Draft EIS Section 3.3.1.

Agricultural infrastructure and utilities required for the dairy operations will include storage tanks and silos, effluent storage ponds, livestock water systems, and drainage improvements. The irrigation system and distribution of livestock water are discussed in Draft EIS Section 3.5, Pasture Management.

The pastoral rotational-grazing dairy provides a local feedstock – grass – as the herd's primary food source. Reducing imported feed stabilizes costs and provides a food source closer to the natural diet of cows. Results of grass trials initially conducted at five sites across four Hawaiian Islands were instrumental in identifying appropriate varieties of grass, and suitable sites to support sufficient "dry matter" grass yields essential to a cow's diet. Additional project-specific trials at the Māhā'ulepū site on Kauai have been conducted for more than 18 months. The results have identified sufficient yield and nutrition to supply 70 percent of the cows' diet; improvements in grass productivity are anticipated to provide up to 85 percent of cows' diet.

The pasture-based model allows cows to move about freely, and to lie down and rest, which is part of the digestion cycle. The animals are managed in social groups known as "mobs", mimicking the natural social order of bovines. Cows spend 22 hours of each 24-hour period foraging on pasture or resting, outdoors in natural light and fresh air. The gently sloped paddocks, walkways and races minimize the energy expended by the mature dairy cows as they graze or are transferred to and from the various paddocks and the mature dairy facility; surfaces of the walkways

and cow races are designed to provide a comfortable path under hoof. The management practices and pasture model applied by HDF maximizes grass as the cows' primary nutrition source and minimizes stress to the animals. Cows tend to be healthier and live longer, productive lives with access to fresh air, high quality feed, and exercise while they forage.

The 470 acres of pasture will be divided into paddocks averaging 3 to 5 acres in size. Smaller paddocks located near the dairy facility will be used as temporary pasture for cows or calves being moved on or off the farm. To protect the water quality of surface water and downstream areas, paddock fences are set back 35 feet from the edge of drainage ways throughout the site. Existing vegetation within the setbacks will be managed or restored to reduce erosion, improve stability of ditch banks, increase net carbon storage, and improve and maintain water quality.

The majority of the pastures will be irrigated with non-potable water and/or diluted effluent through either the pivot irrigation systems or through gun irrigators. Irrigation water supply is provided to the farm from Waita Reservoir, and will be filtered and pumped to the various irrigation components on the farm. The irrigation system is controlled using computer software and GPS receivers to allow very precise application of irrigation and/or diluted effluent on the pasture. The pivots can rotate and apply irrigation water and/or diluted effluent at different rates depending on the actual irrigation needs of the farm.

NRCS provides technical guidance on applying agricultural waste depending on the desired use of the waste. Reflected in the title of the livestock waste guidance for Hawai'i is the parenthetical inclusion of the word "nutrients." Where waste is utilized as a resource, it is being used for the constituent components that provide benefit.

The NRCS Conservation Practice Standard 590, Nutrient Management, applies to commercial fertilizers, organic by-products, waste water, organic matter, and irrigation water. Nutrient management is the practice of managing the amount, rate, source, method of application, and timing of plant nutrients and soil amendments. The timing and application of nutrients will correspond with plant uptake, soil properties and weather conditions. For more information on nutrient balance management see Draft EIS Section 3.5.3, and Draft EIS Appendix D.

The effluent storage ponds are sized to accommodate 30 days of storage for up to 2,000 mature dairy cows, and over 85 days of storage for 699 mature dairy cows. It will be highly unlikely that the storage pond will be full at any time for the contemplated 2,000-cow dairy, and nearly impossible for the committed 699-cow dairy. Throughout the less than 30-day storage period, effluent is planned for application every four days, and the slurry application is expected at least once every 45 days, to ensure that the ponds are kept at manageable levels.

Cows lactate milk following the birth of calves. Newborn calves will be housed on the Māhā'ulepū site and provided essential colostrum and nutrients for a healthy start. During the calves' initial 90 days, they will be transitioned to pasture at HDF before transfer to ranches on Kaua'i to be raised off-site. The committed herd size of

699 mature dairy cows at the Māhā'ulepū site applies to mature mature dairy cows. Animals in various stages of lactation and rest will be transferred between HDF and other partner ranches as needed for animal health and dairy productivity. This will benefit both the dairy and infuse the beef market in Hawai'i with a new, local source of pasture-raised calves. Male calves will become part of the beef cattle herd; heifers (young female calves that haven't given birth) will be raised until ready to return to the HDF herd as a birthing/mature dairy cow. For more information on off-site herd management, refer to Section 3.7 of the Draft EIS.

Health of the herd is of primary importance as the success of a dairy relies on cows effectively producing quality milk. All cows will be treated with a high standard of care. Dairy managers and caretakers will be trained and competent in handling animals to minimize stress and ensure the herds' welfare. A licensed veterinarian may prescribe use of antibiotics approved by the Food & Drug Administration (FDA) for treatment of illnesses. Adherence to guidelines that prohibit milk from cows undergoing antibiotic treatment will ensure no adulteration of milk. Routine laboratory tests of milk for traces of antibiotic residue will be conducted. HDF will not inject cows with bovine growth hormone, referred to as rBST or rBGH.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhā'ulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhā'ulepū Valley

and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Poʻipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhāʻulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawaiʻi Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhāʻulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhāʻulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhāʻulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kauaʻi community.

Regional Water Demand: The adjacent, developed Kōloa-Poʻipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kauaʻi will increase county-wide by 17,300 residents by 2030. The South Kauaʻi population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kauaʻi region (the Kōloa - Poʻipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhāʻulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhāʻulepū watershed.

The HDF site is located on the bottom-land of the upper Māhāʻulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Haʻupu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhāʻulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kauaʻi Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore

recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhāʻulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhāʻulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhāʻulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to

increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Poʻipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kaua'i community.

AIR QUALITY: As a part of the Environmental Impact Statement (EIS), existing air quality conditions and project impacts were evaluated, including dust and odor. Potential odors and emission levels for air pollutants relevant to dairy operations were modeled, as currently there are no cows on site. EIS sections 4.19 and 4.25 provide an evaluation of air quality and odors, including a windrose depicting wind speed and direction in the area (see DEIS Section 4.1, Climate). The full air quality technical report can be found in Draft EIS Appendix I.

Clean Air Act

Under the *Clean Air Act of 1970* (CAA), amended November 1990, the U.S. Environmental Protection Agency (EPA) regulates both large and small sources of air pollutants by establishing National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. The State of Hawai'i has established its own *State Ambient Air Quality Standards* (SAAQS) that are as strict or, in some cases more strict than the NAAQS. State standards prohibit any visible emissions of fugitive dust from construction activities at the property line.

Emissions relevant to livestock operation include particulate matter and fugitive dust. Greenhouse gases related to dairy cows include methane (CH_4) from enteric fermentation, and both methane and nitrous oxide (N_20) emissions from manure application. No State or Federal regulations for greenhouse gas emissions from farm operations or small businesses currently exist.

DUST

Dust will be generated as cows move along soft limestone walkways that connect the paddocks and lead to and from the milking parlor. Potential fugitive dust emission rates were estimated from published literature, where particulate matter (PM) is measurable from the "drylots" of confined dairy operations where animals walk over dirt and dried manure throughout the day.

Applying the emission rates from this available literature greatly overestimates potential emission resulting from HDF. Cows in the pastoral rotational-grazing system will be on pasture 22 hours each day and will spend two hours – in two separate milking cycles –moving to and from the barn for the 10- to 15-minute milking sessions.

Using atmospheric dispersion modeling system (AERMOD), the rates were scaled to the size of the non-pasture areas used by cows at HDF. Results were added to the

background concentration of particulate matter (both PM_{10} and $PM_{2.5}$) measured on the island of Kaua'i, and the total concentration was compared to the State ambient air quality standards. Only the contemplated herd size of up to 2,000 mature dairy cows was modeled, as at the lower threshold of 699 cows, the potential fugitive dust impact would be negligible. The estimated concentration for PM_{10} is 2.01 $\mu g/m^3$, well below the State standard of 150 $\mu g/m^3$. The estimated concentration for $PM_{2.5}$ is 0.23 $\mu g/m^3$, well below the Federal standard of 35 $\mu g/m^3$ (see Draft EIS Section 4.19 and Table 4-19.2).

ODOR

Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF, so air dispersion models were used to determine potential odor levels. Local weather data was used in conjunction with the AERMOD modeling system, and published rates for manure odors emissions for dairy heifers and effluent ponds were adapted to reflect the HDF facilities.

Odor emission sources identified for modeling at HDF were manure in the pasture fields, irrigation water containing diluted nutrients from effluent, the effluent storage ponds, and the dairy buildings. Odor rates from published research were applied. Odor isopleths (a line used to map all points having the same numerical value) were created to display the model findings. Odor is described in "odor units" at the threshold of perception, which is defined by the point at which 50 percent of panelists, in laboratory conditions, cannot smell the odor but 50 percent of the panelists can detect the odor.

Modeling results were generated for worst case meteorological conditions (low wind velocity / mixing). Generally, tradewinds will disperse odors to less than detectable levels beyond the HDF site; in periods of no wind, odor may not be dispersed creating the "worst case" scenario. In these periods without normal tradewind flow, the odor plume would extend to the south of the HDF site. Sections 4.19.2 and 4.25.2 of the EIS include graphics of the potential odor isopleths.

Results for the committed herd size of 699 mature dairy cows show that odors may be detectable by 50 percent of the sensitive population once per 200 hours, or 44 hours per year, within an area that extends approximately 1,670-feet (within one-third of a mile) beyond the dairy farm boundary, and does not reach recreational or residential areas. Results for the contemplated expanded herd size of up to 2,000 mature dairy cows show odors would not extend beyond 2,780 feet outside the HDF boundary (just over half a mile), again not reaching recreational or residential areas, and again with detection limited to 50 percent of the sensitive population approximately 44 hours per year. The parameters used in the analysis were intentionally conservative, and the impacts shown assume an unlikely confluence of worst-case meteorological data, irrigation location, and grazing location. Actual offsite odor impacts are likely to be much lower and/or less frequent than shown; it is likely odor detection beyond the HDF boundaries will be less frequent.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

February 23, 2015

Group 70 International, Inc., 925 Bethel Street, 5th Floor, Honolulu, HI 96813

RE: Hawai'i Dairy Farms, Poipu, Kaua'i
(4) 2-9-003:001 (portion); 006 (portion) (4) 2-9-001:001 (portion)

Aloha,

I am and have been a full time resident of Kauai for 27 years. I raised my three children in Poipu. I have conducted my business as a Licensed Realtor in Poipu for 27 years. I own a home and a legal vacation rental condo in Poipu. I am gravely concerned that allowing the proposed dairy to occupy and operate at the proposed site will be financially and physically devastating to me, my community, my Island and my State. I do not believe that cow's milk is a necessary part of a healthy diet. For the following reasons, I implore you to rule against any permits being approved that would make it possible for this venture to go forward in this location or anywhere along the South Shore of Kauai:

CONCERN:
Involves an irrevocable commitment to loss or destruction of any natural or cultural resource;
Curtails the range of beneficial uses of the environment; (for plants, animals, or humans);
Substantially affects a rare, threatened, or endangered species, or its habitat; and Detrimentally affects air or water quality or ambient noise levels;

• I was married on the Beach at Maha`ulepu and I know of countless others who have enjoyed weddings and marriage renewals, family gatherings, fishing (a huge part of the local culture), hiking, swimming, surfing or horseback riding along the pristine coastline at Maha`ulepu. The air is fresh. There are very few (if any) flies. The water is clean and the sea life prolific. Monk Seals bring their new born babies to rest and bask in the sun on the protected white sand beaches. Shearwaters and Turtles nest in the area. The smell of the dairy alone will make it unbearable for humans to even go to Maha`ulepu to enjoy its natural and cultural resources. Endangered species as well as humans and plants will be further endangered by the risk of runoff from the dairy polluting the coastal waters with cow excrement. Lights at the facility could endanger our "protected" Shearwaters.

CONCERN:
Substantially affects the economic or social welfare of the community or State;
Involves substantial secondary impacts, such as population changes or effects on public facilities;
Involves a substantial degradation of environmental quality;

• As a Realtor, I have clients (home owners and vacation rental property owners) who have told me that they will ABSOLUTELY sell their property and move out of Poipu (and possibly the State) if the proposed dairy moves forward with their plans to operate at Maha`ulepu. One 2nd home owner told me that a dairy (of less than 2000 cows) moved into her home town and can be smelled 30 miles from the source! Poipu… right now has a three year supply (based on absorption rates) of properties on the market for sale. Many of these Sellers have stated that they are selling because of the proposed dairy. Many are selling at a loss. It doesn't take a rocket scientist to realize that lower property values will effect Property Tax Revenues to the State. It is likely to cause a loss of jobs in the hospitality industry across the board, and a reduction in the TAT Revenues as guests catch wind of the stench of manure and share their opinions on Trip Advisor and other social networks. This could bring another rash of foreclosures when folks can't afford to pay their HOA fees due to loss of rental income. Realtors will suffer loss of income which will reduce GET Tax Revenues to the State.

SOLUTION; P L E A S E… find another location for the dairy to move forward without severely impacting our local wildlife, local residents, local businesses, local taxes and local lifestyle!!!

Mahalo,

Brenda Crawford • 2990 Pua Alani Pl • Koloa, HI 96756 • 808 651-8234

Cc:

State of Hawaii, Department of Health, 1250 Punchbowl Street, Honolulu, HI 96813

Jeff Overton Hawaii Dairy Farms, LLC., P.O. Box 1690, Koloa, HI 96756-1690

May 26, 2016

Brenda S. Crawford
2990 Pua Alani Place
Koloa, HI 96756
BrendaSueCrawford@gmail.com

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
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Dear Brenda S. Crawford:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

ARCHAEOLOGICAL AND CULTURAL: The Hawai'i Dairy Farms (HDF) project is subject to a historic preservation review by the State Department of Land and Natural Resources, State Historic Preservation Division (SHPD) under HRS Chapter 6E and Chapter 13-284. An Archaeological Inventory Survey (AIS) and a Cultural Impact Assessment (CIA) were conducted by Scientific Consultant Services (SCS) for the proposed project. EIS Sections 4.7 and 4.8 provide an evaluation of archaeology and cultural resources, with technical studies in Appendix G and H.

A total of sixteen historic properties were identified through a pedestrian survey of the project area and an extended survey area of 100 meters of the northern boundary. Six historic-era sites occur in the project area and 10 sites occur in the extended survey area. Only one of the sites is believed to be associated with pre-

Contact and/or early historic times. State Site 50-30-10-2250, the agricultural heiau, and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area. The remaining sites consist of historic-era bridges, ditches, culverts, retaining walls, and a flume system dating from the 20th century and are affiliated with sugarcane cultivation.

That a majority of the documented sites are related to the historic-era is not surprising, given the massive landscape modifications that occurred during intensive sugarcane cultivation on the valley floor. Even historic era cultural materials associated with the many Land Commission Awards in the project area were non-existent, as explored through survey and subsurface exploration.

The sixteen historic properties have been assessed for significance by the archaeological consultant and the dairy project is anticipated to have no impact on these sites. No further archaeological work is recommended for the sites. Two of the sixteen sites are considered significant under multiple criteria, but occur outside the project area on lands owned by a different landowner. Both sites will not be adversely affected by the proposed dairy project. No site is related to burials, and no bonex were found. Such sites have been reported along coastal areas in sand dunes.

The cultural assessment examined the potential effect of the project on cultural resources, practices or beliefs, its potential to isolate cultural resources, practices or beliefs from their setting, and the potential of the project to introduce elements which may alter the setting in which cultural practices take place. Information received from the community indicates the Māhā'ulepū Ahupua'a, has been and is currently used for traditional cultural purposes. However, the dairy project area has not been included in these activities. It is clear that the gathered plants, trails, State Site 50-30-10-2250, the agricultural heiau, and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area.

The project will be fully enclosed by perimeter fencing along the boundary of the leased premises, which will ensure that project activities and any related impacts are contained within the project area. Based on the research and comments received from the community, it is reasonable to conclude that, pursuant to Act 50, the exercise of native Hawaiian rights or any ethnic group related to numerous traditional cultural practices will not be impacted by establishment of the dairy.

FLORA AND FAUNA: Botanical, avian, and mammalian surveys of the property were conducted for the Draft Environmental Impact Statement (EIS) to assess existing species on site, including identifying any species listed as endangered, threatened, or proposed under any state or federal endangered species programs in or near the property. EIS Sections 4.9 and 4.10 address the evaluation of flora and fauna resources, with technical studies in Appendix A and B.

A botanical survey of the dairy property was conducted in August 2014 by AECOS Consulting to assess existing plant species. The survey also investigated for the presence of plants currently listed as endangered, threatened or proposed for listing under Federal or the State of Hawai'i's endangered species programs, located onsite or within the immediate vicinity of the dairy site. The nature of the land and its

present and historical uses for intensive agriculture very much limit the natural botanical resources anticipated to occur on this land. Complete species lists are included in the EIS, and no protected botanical species occur on the project property. The project will include vegetated buffer strips along the drainage ways as part of the Conservation Plan to reduce erosion and stabilize slopes. Where native plants occur or could survive if planted, native plants will be used in the stabilization. No long-term impacts to native plant habitats or endangered or threatened plants species will occur as a result of the dairy.

Avian and mammalian surveys were conducted in August 2014 by Rana Biological Consulting, Inc. This survey was conducted to assess the potential presence of avian or mammalian species currently listed as endangered, threatened or proposed for listing under either Federal or the State endangered species lists. The survey covered the dairy site area and immediate vicinity. Common birds and terrestrial mammals were encountered on the property. There is no critical habitat for endangered species in the upper Māhāʻulepū Valley.

Four species of endangered waterbirds were recorded on the site and at the nearby taro farm located within the HDF site. Though the area does not provide critical habitat, seabirds that nest in upland areas of Kauai may overfly the site. The endangered Hawaiian goose, nēnē was also seen on the site. State Division of Forestry and Wildlife biologists have noted nēnē are regularly seen on the subject property. It is probable that some nest on or adjacent to the site as this species nests in the general Kōloa area, and the habitat present on parts of the site is suitable for nēnē nesting.

The principal potential impacts posed to the five endangered species include those potentially associated with construction activities, and those associated with dairy farm operations following build-out. Measures will be adopted to avoid potential seabird and nēnē goose collisions with fences and structures. Potential measures include lowering construction cranes at night, using conservation fencing to project-specified areas, marking tall structures and fencing with white visibility polytape, limiting nighttime lighting, and shading any outside lights used at night. Ongoing mitigation strategies will be implemented for day-to-day preventative measures, including an Avian Species Protection Plan. Mitigation measures are further described in DEIS Section 4.10.2.

It is also likely that Hawaiian hoary bats overfly the project area on a seasonal basis. While caution will be taken during any potential disturbance or vegetation removal, there are almost no suitable roost trees within the dairy site, thus it is expected that the dairy farm will not affect this listed mammalian species.

PESTS: A study of invertebrate species and pest insects was conducted by Steven Lee Montgomery, PhD, Consulting Biologist in January 2016. The study summarizes the presence or absence of native species or pest species associated with cattle manure in the general Māhāʻulepū area, as well as the parasites and predators that control those species. No federally or state listed endangered or threatened invertebrate species were noted in the survey of the site. A full report and list of species found on site is provided in EIS Section 4.11 and Appendix B.

Flies were identified on the HDF site using manure from neighboring livestock as bait for invertebrates. The two flies associated with livestock are the stable fly and the horn fly, the latter known for biting cattle. These flies and the greenbottle fly are often confused with the house fly. Flies known to exist on Kauaʻi but not seen at the HDF site include the house fly, the dog dung fly, and the chicken dung fly. These pests are common in areas with high pet populations. It is possible these fly species could inadvertently be brought to the dairy and utilize manure as a food source. HDF will prevent and control fly population growth through diligent clean up and sanitation practices regarding any trash and food waste, as well as through efficient manure composting practices. A full list of site management measures is provided in EIS Section 4.11. The project location does not provide any habitat for *drosophila musaphilia*, the only Kauaʻi species of native Hawaiian fly listed as Endangered or Threatened. Native Drosophila habitat is located many miles away in the high elevation koa-ʻōhiʻa forests.

Fly populations at HDF will be minimized through a process known as Integrated Pest Management (IPM). Essentially, IPM disrupts reproduction with appropriate means at key points in the pest's life cycle. Used in Hawaiʻi for decades, a number of invertebrates and a bird (the cattle egret) were introduced between 1898 and 1950 to reduce livestock-related insects. IPM utilizes knowledge of the ancient food web among species.

An especially important insect to minimize fly breeding habitat in manure is the dung beetle, which buries manure and incorporates it into the soil. Populations of dung beetles found on Kauaʻi and those species already in Māhāʻulepū Valley, will increase with the increased manure food source, thus increasing and speeding breakdown of manure. Dung beetles are specialists in the very important natural process of breaking up and quickly recycling bovine manure pads. The behavioral diversity among dung beetle species will work together to bury dung pats in one to three days, a shorter amount of time than the 10-30 days flies eggs need to hatch.

In the Kōloa-Poʻipū region, pest fly populations are dependent upon food and breeding sources nearby such as dog, cat, and chicken feces. Beef cattle graze in the region on agricultural lands along Ala Kinoiki Road between Kōloa and Poʻipū, and it is likely the livestock-related flies identified at the HDF site occur in this region as well. Localized controls to reduce pest populations need to address breeding sites in and amongst the food and animals wastes within the area. These mitigation measures will make it difficult for flies to breed, and BMPs will be enforced to address any increase in population, therefore it is expected that the dairy farm will not significantly affect recreational and resort areas.

DEMOGRAPHIC AND ECONOMIC: The potential impacts of Hawai'i Dairy Farms (HDF) to the existing economy were evaluated in the Draft Environmental Impact Statement (EIS), including a fiscal impact assessment report completed in April, 2016 by Plasch Economics Pacific. Draft EIS Section 4.15 addresses demographic and economic factors, with the complete report in Appendix J.

The HDF project would create short-term benefits through jobs for local construction personnel and local material suppliers. Such jobs would include equipment operators, cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, supervisors, painters, etc. Based on State employment multipliers, indirect employment related to Dairy construction would be expected to average about 16 jobs on Kaua'i, and 8 on O'ahu. Construction employment would be expected to average about 12 jobs per year during the development period. Thus direct-plus-indirect employment association with construction would be expected to average approximately 36 jobs, of which 28 would be on Kaua'i.

The HDF project would contribute to diversification of Kaua'i's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Hawai'i Island), approximately10 percent of Hawai'i's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and indirect full-time equivalent jobs on Kaua'i, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on O'ahu.

HDF is expected to generate a net income of approximately $68,000 to the County when the 699 cow herd is established. When the dairy has matured to full production for the 699 cow dairy, net income to the State is calculated at $160,000 annually. With the potential contemplated herd size of up to 2,000 mature dairy cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be produced. This would double local milk production currently supplied by operational dairies on the Island of Hawai'i.

Additional employment generated by a possible expansion to accommodate the contemplated 2,000 mature dairy cow herd is estimated at approximately 3 construction jobs plus 4 indirect jobs on Kaua'i, and 2 indirect jobs on O'ahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an additional 5 full-time farm jobs would be added, with approximately 15 additional indirect jobs on Kaua'i and another 8 indirect jobs on O'ahu.

The dairy is expected to generate a net additional contribution to the County of approximately $8,000 for improvements related to expansion for the contemplated herd size of up to 2,000 mature dairy cows ($76,000 total versus $68,000 for the committed herd size). The State will derive approximately $360,000 annually in revenues from the contemplated 2,000-mature dairy cow dairy.

Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhā'ulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhā'ulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Po'ipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhā'ulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawai'i Department of Health Milk

Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhāʻulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhāʻulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhāʻulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kauaʻi community.

Regional Water Demand: The adjacent, developed Kōloa-Poʻipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kauaʻi will increase county-wide by 17,300 residents by 2030. The South Kauaʻi population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kauaʻi region (the Kōloa - Poʻipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhāʻulepū Surface

Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhāʻulepū watershed.

The HDF site is located on the bottom-land of the upper Māhāʻulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Haʻupu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhāʻulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kauaʻi Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhāʻulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhāʻulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhāʻulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Poʻipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kauaʻi community.

AIR QUALITY: As a part of the Environmental Impact Statement (EIS), existing air quality conditions and project impacts were evaluated, including dust and odor. Potential odors and emission levels for air pollutants relevant to dairy operations were modeled, as currently there are no cows on site. EIS sections 4.19 and 4.25 provide an evaluation of air quality and odors, including a windrose depicting wind speed and direction in the area (see DEIS Section 4.1, Climate). The full air quality technical report can be found in Draft EIS Appendix I.

Clean Air Act

Under the *Clean Air Act of 1970* (CAA), amended November 1990, the U.S. Environmental Protection Agency (EPA) regulates both large and small sources of

air pollutants by establishing National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. The State of Hawai'i has established its own *State Ambient Air Quality Standards* (SAAQS) that are as strict or, in some cases more strict than the NAAQS. State standards prohibit any visible emissions of fugitive dust from construction activities at the property line.

Emissions relevant to livestock operation include particulate matter and fugitive dust. Greenhouse gases related to dairy cows include methane (CH_4) from enteric fermentation, and both methane and nitrous oxide (N_20) emissions from manure application. No State or Federal regulations for greenhouse gas emissions from farm operations or small businesses currently exist.

DUST

Dust will be generated as cows move along soft limestone walkways that connect the paddocks and lead to and from the milking parlor. Potential fugitive dust emission rates were estimated from published literature, where particulate matter (PM) is measurable from the "drylots" of confined dairy operations where animals walk over dirt and dried manure throughout the day.

Applying the emission rates from this available literature greatly overestimates potential emission resulting from HDF. Cows in the pastoral rotational-grazing system will be on pasture 22 hours each day and will spend two hours – in two separate milking cycles –moving to and from the barn for the 10- to 15-minute milking sessions.

Using atmospheric dispersion modeling system (AERMOD), the rates were scaled to the size of the non-pasture areas used by cows at HDF. Results were added to the background concentration of particulate matter (both PM_{10} and $PM_{2.5}$) measured on the island of Kaua'i, and the total concentration was compared to the State ambient air quality standards. Only the contemplated herd size of up to 2,000 mature dairy cows was modeled, as at the lower threshold of 699 cows, the potential fugitive dust impact would be negligible. The estimated concentration for PM_{10} is 2.01 $\mu g/m^3$, well below the State standard of 150 $\mu g/m^3$. The estimated concentration for $PM_{2.5}$ is 0.23 $\mu g/m^3$, well below the Federal standard of 35 $\mu g/m^3$ (see Draft EIS Section 4.19 and Table 4-19.2).

ODOR

Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF, so air dispersion models were used to determine potential odor levels. Local weather data was used in conjunction with the AERMOD modeling system, and published rates for manure odors emissions for dairy heifers and effluent ponds were adapted to reflect the HDF facilities.

Odor emission sources identified for modeling at HDF were manure in the pasture fields, irrigation water containing diluted nutrients from effluent, the effluent storage ponds, and the dairy buildings. Odor rates from published research were

applied. Odor isopleths (a line used to map all points having the same numerical value) were created to display the model findings. Odor is described in "odor units" at the threshold of perception, which is defined by the point at which 50 percent of panelists, in laboratory conditions, cannot smell the odor but 50 percent of the panelists can detect the odor.

Modeling results were generated for worst case meteorological conditions (low wind velocity / mixing). Generally, tradewinds will disperse odors to less than detectable levels beyond the HDF site; in periods of no wind, odor may not be dispersed creating the "worst case" scenario. In these periods without normal tradewind flow, the odor plume would extend to the south of the HDF site. Sections 4.19.2 and 4.25.2 of the EIS include graphics of the potential odor isopleths.

Results for the committed herd size of 699 mature dairy cows show that odors may be detectable by 50 percent of the sensitive population once per 200 hours, or 44 hours per year, within an area that extends approximately 1,670-feet (within one-third of a mile) beyond the dairy farm boundary, and does not reach recreational or residential areas. Results for the contemplated expanded herd size of up to 2,000 mature dairy cows show odors would not extend beyond 2,780 feet outside the HDF boundary (just over half a mile), again not reaching recreational or residential areas, and again with detection limited to 50 percent of the sensitive population approximately 44 hours per year. The parameters used in the analysis were intentionally conservative, and the impacts shown assume an unlikely confluence of worst-case meteorological data, irrigation location, and grazing location. Actual offsite odor impacts are likely to be much lower and/or less frequent than shown; it is likely odor detection beyond the HDF boundaries will be less frequent.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

From: Judy Dalton
To: epo@doh.hawaii.gov; HDF
Subject: Hawaii Dairy Farm Proposed dairy at Maha"ulepu, Kauai
Date: Monday, February 23, 2015 11:58:52 PM

Re: Notice of Preparation of DEIS for HDF at Maha'uelpu, Kaua'i

Aloha Ms. McIntyre and Mr. Overton,

I request that the DEIS explain why Maha'ulepu, the most treasured of all places in the entire state
of Hawaii, was chosen as the place for a dairy.

Maha'ulepu was held in highest regard by Congresswoman Patsy Mink, who upon seeing it for the first time, exclaimed that it should be designated as a National Monument. She sent cards with pictures of Maha'ulepu to each member of congress encouraging them to support the idea.

Governor Cayetano referred to Maha'ulepu as the crown jewel of the state of Hawaii.

Senator Brian Schatz is working toward a permanent means of protecting Maha'ulepu
through the National Parks system.

Thousands of people have signed their names to a record of support to preserve Maha'ulepu in its natural state.

Maha'ulepu can sustain the right kind of agriculture, but a dairy farm with its potential impacts of irreversible harm is clearly not the right kind of agriculture.

So, the question is why Maha'uelpu? Why this magnificent environmental treasure?

Respectfully,

Judy Dalton
4330 Kauai Beach Drive
Lihue, HI 96766
808-246-9067

GROUP 70 INTERNATIONAL

May 26, 2016

Judy Dalton
4330 Kauai Beach Drive
Lihue, HI 96766
judydalton123@gmail.com

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Judy Dalton:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

ALTERNATIVES: As a part of the DEIS, alternatives were evaluated that could attain the objectives of the action's purpose and need, and were compared with environmental benefits, costs, and risks of each reasonable alternative against those of the proposed dairy project. Further discussion of alternatives can be found in DEIS Section 6.

The DEIS evaluates alternatives that could attain the objectives of the action's purpose and need, and compares environmental benefits, costs, and risks of each reasonable alternative against those of the proposed action. Additionally, reasonable land use alternatives that emerged from public input during the project scoping phase are documented and briefly discussed. The alternatives that do not meet the project purpose are not advanced for analysis of environmental benefits,

costs, and risks. The Environmental Impact Statement Rules, Hawai'i Administrative Rules Chapter 11-200 (HRS 11-200) requires a discussion of alternatives that could attain the objectives of the action, regardless of cost. There is no requirement for the alternatives analysis to consider every possible land use.

Four possible land uses that would not meet the project purpose are discussed. Rezoning the land for resort or residential development, or a potential conservation condemnation are two uses that were examined and eliminated from analysis. These options would not be reasonably viable given the existing private land tenure and existing zoning. Two additional alternatives were considered as reasonable land uses as they could be permitted within the existing State Land Use Agricultural District and County Agricultural Zoning District. These options include Agricultural Park with Processing Center, and development of an Agricultural Subdivision. The alternatives were examined and eliminated from further analysis, however, as they would not fulfill the project purpose.

The analysis, therefore, focuses on alternatives that meet the project purpose. Rigorous exploration and evaluation of the environmental impacts of the alternatives, including those that might enhance environmental quality or avoid, reduce or minimize some or all of the adverse environmental effects, costs and risks. These alternatives include: (1) the development of a Conventional Feedlot Dairy (a non-pasture-based dairy) at the same location; (2) development of the Pasture-Based Dairy at an Alternative Location on Kaua'i; and (3) milk products processing by HDF. The alternative of "No Action" is also evaluated.

The alternatives analysis provides a comprehensive evaluation of the range of potential alternatives, including the two alternative development scenarios. Although the alternatives are potentially reasonable uses under existing zoning and neighboring uses, each fails to comprehensively fulfill the project requirements defined by the eight Project Objectives and the four established Evaluation Criteria (Chapter 2, Sections 2.3.3 and 2.3.4).

The essential differences as compared to the proposed action are highlighted in the following statements.

- Only one of the alternative actions (conventional feedlot alternative) would create a commercial scale dairy operation in Hawai'i, with the capability to produce 10 percent of the State's fresh milk demand thus reducing dependence on imported milk (Objective 1). This alternative, however, would not reduce reliance on costly imported fertilizer and feed (Objective 2); grow local, quality grass as a primary feedstock (Objective 3); and would not utilize 100 percent of manure on site as nutrients to grow forage for dairy cows (Criterion 4).
- None of the alternatives would secure a dairy location that meets the requirements for a pastoral, pasture-based grazing dairy: sufficient contiguous land area; available long-term land tenure; adequate potable water supply; suitable soil properties; gentle slope conditions; and accessibility (Criterion 1).
- One alternative (Agricultural Park) could potentially generate new long-term

employment in the agricultural sector on Kaua'i in a wide range of positions including pasture agronomy/soils science, environmental resources management (Criterion 2).
- The Agricultural Park alternative could also develop sustainable food production utilizing Important Agricultural Lands, demonstrating the importance of long-term agricultural leases and capital investment for agricultural infrastructure, water systems and support facilities. (Criterion 3). However, after years of trying, it appears there was limited interest in such a venture.
- Finally, addressing the range of potential environmental impacts (natural, cultural, social and economic) (Objective 8) the two alternative development scenarios would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.

In contrast to the other options considered, the planned agricultural operation of Hawai'i Dairy Farms, was determined to be the most viable option and is the preferred alternative. Of all the alternatives considered, this is the only approach that achieves project objectives and meets each of the four Evaluation Criteria.

- Hawai'i Dairy Farms will create a commercial scale pasture-based dairy operation in Hawai'i, with the capability to provide more than 1,000,000 gallons of the fresh milk demand, reducing dependence on imported milk (Objective 1).
- The planned dairy location meets the requirements of minimum land area, soil properties, slope conditions, water supply, land tenure and availability, and accessibility (Criterion 1).
- The planned action will generate new long-term employment in the agricultural sector on Kaua'i, including pasture agronomy/soils science, veterinary and animal husbandry, environmental resources management, milk/milk processing, and dairy business management (Criterion 2).
- Sustainable food production utilizing Important Agricultural Lands (Criterion 3) will occur with the proposed action, demonstrating the importance of long term agricultural leases, and the ability to draw capital investment for agricultural infrastructure including water systems and support facilities (Criterion 3).
- Address the range of potential environmental impacts by utilizing 100 percent of manure as natural fertilizer to grow the majority of food for cows (Criterion 4). The alternatives evaluated would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.
- Creating an economically viable pasture rotational-grazing model maintains agriculture, retains open space, and provides buffer between highly utilized resort and residential development and sensitive natural or cultural resources (Objective 8).

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

February 18, 2014

Group 70 International

Attn: Jeff Overton, HDF Project

925 Bethel St 5th floor

Honolulu, Hi 96813

I am a lifetime resident of Hawaii and a 50 year resident of Koloa-Poipu. I moved to Poipu before the first hotel was built. My late husband, Walter Briant, built the Kauai Department of Water on Kauai, including the wells near the dairy site in Koloa. He also enjoyed windsurfing at Maha'ulepu and we both enjoyed hiking along Maha'ulepu's costal trails.

I am concerned that construction of a dairy, which will eventually include 2000 cows, will negatively impact the quality of the ground water which my husband Walter Briant, considered the best water on Kauai. It will most likely pollute the ocean water with run off particularly during storms. I remember about 7 years ago when we had 40+ days of rain and part of Koloa town was a lake. We have also had two major hurricanes centered in this area. We need a hydrological study to show how ground and ocean water will be affected by the proposed Dairy operation.

The air quality in Koloa - Poipu will most likely be degraded from such a large dairy operation. The wind normally blows toward my house in the Weliweli subdivision from the direction of the proposed dairy site and the smell most likely will be terrible. We need and air quality study to assess whether the air quality would be adversely affected by the proposed dairy operation.

I am a bee keeper. My bees won first place in Hawaii for the best tasting honey. I am concerned that the sprays used to control flies would affect my bees who range up to 7 miles when they are looking for pollen and nectar

I cannot imagine how the Grand Hyatt with visitors from all over the world will be able to continue to operate with the smell and potential ocean pollution that such a large dairy operation will produce. The Hyatt employs over one thousand employees. I understand the dairy will employ around twenty employees. That may mean a net loss of jobs for many Kauai residents and wide spread economic loss for the island.

Please include me as a consulting party for the draft EIS.

Carol Ann Davis-Briant

Carol Ann Davis-Briant
2381 Kipuka St
Koloa Hi 96756
(808) 742-6523
carolanndavis@hawaii.rr.com

May 26, 2016

Carol Ann Davis-Briant
2381 Kipuka Street
Koloa, HI 96756
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Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Carol Ann Davis-Briant:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

DAIRY OPERATIONS: Hawai'i Dairy Farms (HDF) will establish and operate a sustainable, pastoral rotational-grazing dairy farm in Māhā'ulepū Valley on the island of Kaua'i to produce fresh, locally available nutritious milk for Hawai'i families. The rotational-grazing method utilizes 100 percent of the cows' manure as natural fertilizer to grow pasture grass as a primary source of nutrition for dairy cows. This cost-effective method will reduce reliance on imported fertilizer and feed. Pasture grass will comprise at least 70 percent of the animals' diet. As a part of the Draft Environmental Impact Statement (EIS), the proposed facilities and operations for the dairy farm are described in Chapter 3.

The Environmental Impact Statement (EIS) Preparation Notice (EISPN), published January 23, 2015, described the proposed pasture-based rotational grazing system

as a "zero-discharge, grass-fed dairy". The term "zero-discharge" under the U.S. Environmental Protection Agency related to concentrated feeding operations (CAFO) is a system designed to not discharge pollutants into waters of the United States. As noted previously, the HDF system is designed to utilize 100 percent of the cows' manure on-site. However, nutrients would be introduced to the HDF site with any use; the Draft EIS identifies the amount of nutrients anticipated from the proposed dairy operations that could pass through to ground and surface waters. Therefore, HDF elected to discontinue use of the term "zero discharge" as it was construed as no nutrients into the system.

The term "grass-fed" was used in the HDF EISPN. This term was used to identify HDF's intent to utilize a locally-produced feedstock – grass – for more than 70 percent of the dairy herds' diet. In January 2016, the U.S. Department of Agricultural (USDA) Marketing Survey created a narrow legal definition of "grass-fed". The USDA standard defines what animals can and cannot be fed. The Food Alliance, a project of several northwest colleges, believes that when consumers choose grass-fed products there is an expectation that these will come from animals raised on pasture on a forage-based diet. Due to the evolving definition of "grass-fed", the term in not used in this EIS.

The dairy facilities will occupy an area of approximately 10 acres on the western boundary of the site. The developed area "footprint" will be less than 2 percent of the total farm area. Four buildings will be constructed to serve different functions, supported by utilities and infrastructure. Additional building information can be found in Draft EIS Section 3.3.1.

Agricultural infrastructure and utilities required for the dairy operations will include storage tanks and silos, effluent storage ponds, livestock water systems, and drainage improvements. The irrigation system and distribution of livestock water are discussed in Draft EIS Section 3.5, Pasture Management.

The pastoral rotational-grazing dairy provides a local feedstock – grass – as the herd's primary food source. Reducing imported feed stabilizes costs and provides a food source closer to the natural diet of cows. Results of grass trials initially conducted at five sites across four Hawaiian Islands were instrumental in identifying appropriate varieties of grass, and suitable sites to support sufficient "dry matter" grass yields essential to a cow's diet. Additional project-specific trials at the Māhā'ulepū site on Kauai have been conducted for more than 18 months. The results have identified sufficient yield and nutrition to supply 70 percent of the cows' diet; improvements in grass productivity are anticipated to provide up to 85 percent of cows' diet.

The pasture-based model allows cows to move about freely, and to lie down and rest, which is part of the digestion cycle. The animals are managed in social groups known as "mobs", mimicking the natural social order of bovines. Cows spend 22 hours of each 24-hour period foraging on pasture or resting, outdoors in natural light and fresh air. The gently sloped paddocks, walkways and races minimize the energy expended by the mature dairy cows as they graze or are transferred to and from the various paddocks and the mature dairy facility; surfaces of the walkways

and cow races are designed to provide a comfortable path under hoof. The management practices and pasture model applied by HDF maximizes grass as the cows' primary nutrition source and minimizes stress to the animals. Cows tend to be healthier and live longer, productive lives with access to fresh air, high quality feed, and exercise while they forage.

The 470 acres of pasture will be divided into paddocks averaging 3 to 5 acres in size. Smaller paddocks located near the dairy facility will be used as temporary pasture for cows or calves being moved on or off the farm. To protect the water quality of surface water and downstream areas, paddock fences are set back 35 feet from the edge of drainage ways throughout the site. Existing vegetation within the setbacks will be managed or restored to reduce erosion, improve stability of ditch banks, increase net carbon storage, and improve and maintain water quality.

The majority of the pastures will be irrigated with non-potable water and/or diluted effluent through either the pivot irrigation systems or through gun irrigators. Irrigation water supply is provided to the farm from Waita Reservoir, and will be filtered and pumped to the various irrigation components on the farm. The irrigation system is controlled using computer software and GPS receivers to allow very precise application of irrigation and/or diluted effluent on the pasture. The pivots can rotate and apply irrigation water and/or diluted effluent at different rates depending on the actual irrigation needs of the farm.

NRCS provides technical guidance on applying agricultural waste depending on the desired use of the waste. Reflected in the title of the livestock waste guidance for Hawai'i is the parenthetical inclusion of the word "nutrients." Where waste is utilized as a resource, it is being used for the constituent components that provide benefit.

The NRCS Conservation Practice Standard 590, Nutrient Management, applies to commercial fertilizers, organic by-products, waste water, organic matter, and irrigation water. Nutrient management is the practice of managing the amount, rate, source, method of application, and timing of plant nutrients and soil amendments. The timing and application of nutrients will correspond with plant uptake, soil properties and weather conditions. For more information on nutrient balance management see Draft EIS Section 3.5.3, and Draft EIS Appendix D.

The effluent storage ponds are sized to accommodate 30 days of storage for up to 2,000 mature dairy cows, and over 85 days of storage for 699 mature dairy cows. It will be highly unlikely that the storage pond will be full at any time for the contemplated 2,000-cow dairy, and nearly impossible for the committed 699-cow dairy. Throughout the less than 30-day storage period, effluent is planned for application every four days, and the slurry application is expected at least once every 45 days, to ensure that the ponds are kept at manageable levels.

Cows lactate milk following the birth of calves. Newborn calves will be housed on the Māhā'ulepū site and provided essential colostrum and nutrients for a healthy start. During the calves' initial 90 days, they will be transitioned to pasture at HDF before transfer to ranches on Kaua'i to be raised off-site. The committed herd size of

699 mature dairy cows at the Māhā'ulepū site applies to mature mature dairy cows. Animals in various stages of lactation and rest will be transferred between HDF and other partner ranches as needed for animal health and dairy productivity. This will benefit both the dairy and infuse the beef market in Hawai'i with a new, local source of pasture-raised calves. Male calves will become part of the beef cattle herd; heifers (young female calves that haven't given birth) will be raised until ready to return to the HDF herd as a birthing/mature dairy cow. For more information on off-site herd management, refer to Section 3.7 of the Draft EIS.

Health of the herd is of primary importance as the success of a dairy relies on cows effectively producing quality milk. All cows will be treated with a high standard of care. Dairy managers and caretakers will be trained and competent in handling animals to minimize stress and ensure the herds' welfare. A licensed veterinarian may prescribe use of antibiotics approved by the Food & Drug Administration (FDA) for treatment of illnesses. Adherence to guidelines that prohibit milk from cows undergoing antibiotic treatment will ensure no adulteration of milk. Routine laboratory tests of milk for traces of antibiotic residue will be conducted. HDF will not inject cows with bovine growth hormone, referred to as rBST or rBGH.

NATURAL HAZARDS: The potential impacts of natural hazards are evaluated in the Draft Environmental Impact Statement (EIS), including flooding, tsunami, earthquakes, and hurricanes. Draft EIS Section 4.6 addresses natural hazards.

The Māhā'ulepū property is not known to experience flooding conditions. The area is located within Federal Emergency Management Agency (FEMA) Zone X, areas determined to be outside the 0.2% annual chance floodplain. The proposed location for Hawai'i Dairy Farms (HDF) lies between the 60 and 150 feet elevation, outside the tsunami evacuation zone. The Kaua'i and Ni'ihau region of the Hawaiian Islands has experienced tremors from earthquakes originating further south in the island chain, but no known seismic activity has originated among these northern islands.

Although they occur infrequently, Kaua'i has received a greater amount of damage from hurricanes when compared to the other Hawaiian Islands. Land management personnel in the Māhā'ulepū region during and following the hurricanes that affected Kaua'i in 1982 and 1992 observed defoliation of vegetation, and no flooding events in the period following passage of the storms.

Preparedness is the best protection for natural disasters. Structural design of dairy facilities will meet International Building Code (IBC) 2006 standards with local amendments. Provisions in design will address wind loading (including hurricane gusts), rain and flood loading, and earthquake loading. A geotechnical evaluation of the area recommended Seismic Site Class D under IBC standards be utilized for foundation design where the barns and agricultural infrastructure will be constructed.

There has been no rainfall event that would exceed the capacity of the effluent ponds since rainfall has been recorded in Māhā'ulepū Valley. The effluent pond capacity has been designed above the regulatory requirement to contain the 25-year, 24-hour rainfall event. An emergency containment berm with additional

capacity for another 30 days is included in the design. This design exceeds regulatory requirements, with containment in excess of the major rainfall events recorded on Kaua'i over the past three decades.

An emergency preparedness plan for protection of animals has been prepared for HDF internal use that addresses hurricane, fire, and potential flooding hazard scenarios. HDF is not in a tsunami inundation area, so this scenario is not planned for in the disaster plan. The disaster plan relies upon knowledge of cow behavior, and is based on extensive guidance for livestock protection from NRCS, the Florida State Agricultural Response Team (SART), Pennsylvania State College of Agricultural Sciences, and Cornell University Cooperative Extension. The plan includes safety procedures during any disaster, follow up actions, and emergency contacts for assistance before, during or following the event. Further information is provided in the Draft EIS Section 4.6.2.

INVERTEBRATE SPECIES: A study of invertebrate species and pest insects was conducted by Steven Lee Montgomery, PhD, Consulting Biologist. The study summarizes the presence or absence of native species or pest species associated with cattle manure in the general Māhā'ulepū area, as well as the parasites and predators on site that control those species. Fieldwork was conducted during September 15-16, 2014. The entire study is included in Draft Environmental Impact Statement (EIS) as Appendix B.

CAVE AND LAVA TUBE INVERTEBRATES

There are no known caves or lava tubes found at or adjacent to the dairy farm property. The Kōloa Lava Tube System, which provides habitat for two endemic cave species, the Kaua'i Cave Wolf Spider and the Kaua'i Cave amphipod, is located several miles away from the dairy farm property. Both invertebrates are listed as endangered under the U.S. Endangered Species Act. Not all caves in the Kōloa area contain these invertebrates, as many do not contain the optimal climatological conditions required by these organisms. Neither the botanical and faunal survey nor the invertebrate survey revealed any evidence of lava tubes or caves on the property, and no such features have been reported for the area near the Hawai'i Dairy Farms (HDF) site. Thus no cave invertebrate species will be affected by the dairy farm.

INTRODUCED PREDATOR INSECTS

An invertebrate study of manure-associated insects was conducted for the Draft EIS. The study included a field survey that used manure from an adjacent beef cattle herd as a lure, and determined flies and other manure-related insects currently present at the HDF site. Pest insects such as flies can negatively impact livestock health and production, and are therefore actively managed to prevent stress and loss of productivity at dairy operations.

At the HDF site, two common flies were identified: the stable fly and the horn fly. Both of these flies are widespread throughout the Hawaiian Islands. The greenbottle fly was reared from manure taken back to a laboratory following the field survey.

Additionally, flies known to exist on Kaua'i but not seen at the HDF site during the survey were identified and include the house fly, the dog dung fly, and the chicken dung fly. These pests are common in areas with high pet populations.

In response to cattle-related insect pests, numerous species known to compete with the pests were introduced to Hawai'i between 1898 and 1982. Twenty species of predators and competitors to the horn fly were successfully established during that period. Cattle egrets break up dung patties while searching for prey, and were introduced to Hawai'i in the late 1950s to control cattle-associated insects. Extensive introduction of dung beetle species resulted in 14 dung beetle species becoming established on Kaua'i.

A healthy population of dung beetles can bury a dung pat in one to three days, which disrupts reproduction of flies such as the stable fly and horn fly. The stable fly requires approximately 21 days within the dung patty for the immature life stage (egg to pupa) to survive; the horn fly takes 10 to 20 days from egg to adult. Incorporation of the manure into the soil profile by dung beetles removes the habitat these flies require to complete their lifecycle. Research shows that 95 percent fewer horn flies emerged from dung patties containing a dung beetle species that has been identified at the HDF site. Proven control methods for the stable fly include parasitic micro-wasps and spreading out manure.

Among the invertebrates previously introduced to Hawai'i to combat livestock-related flies are extremely tiny parasitic wasps that prey on various fly species. The adult wasps could be described as the size of gnat. Using an ovipositor – described by lay people as a "stinger" – the female lays eggs in the larvae or pupa of flies. The male wasp has no such "stinger". See Draft EIS Section 4.11 for a photo providing scale for these tiny, non-stinging wasps.

To minimize potential establishment of pest flies or other insects, food waste generated during the construction phase will be bagged, covered, contained and disposed of in order to limit possible breeding habitat for flies. Inspections of building materials for ants or other insects will be conducted to prevent introduction of new pests to the HDF site. Short-term controls, including mechanical methods (e.g. sticky tapes or ribbons in the milking parlor, or traps with or without attractants) and chemical methods may be used to prevent short-term spikes in pest populations.

Insecticides and herbicides are non-discriminatory and kill beneficial as well as pest insects. Beneficial insects include primary decomposers such as earthworms and dung beetles, and pollinators including bees. Should chemical control be needed for short-term spikes in pest populations, application would be by those qualified, and in accordance with regulatory labeling requirements. HDF will implement long-term integrated pest management, which utilizes knowledge of the ancient food web among species by disrupting the manure habitat required to complete the fly life cycle. HDF and other ranchers on Kaua'i may choose to engage with the State Department of Agriculture to translocation dung beetle species already introduced on Kaua'i to Māhā'ulepū and other areas where manure-related flies may be a problem.

IMPACT OF SPRAYS ON BEES

Beneficial insects include primary decomposers such as earthworms and dung beetles, and pollinators including bees. Honey bees are an essential part of any agricultural ecosystem, and were observed on site during the invertebrate species survey. Pesticides and herbicides can reduce populations of beneficial insects, which is why HDF will utilize an integrated pest management approach.

It is expected that honey bees will visit water sources set up for the HDF herd. Preventative measures will be built into any open water source to prevent bees from being trapped, and HDF will contact local beekeepers for advice regarding any bees or bee colonies encountered on site. Safe application practices for any unavoidable herbicide or pesticide will be utilized in order to narrowly target the correct pest species without harming other insects and animals in the area. Anyone using herbicides or pesticides will be properly trained and informed, and if a honey bee colony location appears to be a danger to workers or cattle, or to be in danger itself, a local beekeeper will be contacted for advice and removal.

PESTS: A study of invertebrate species and pest insects was conducted by Steven Lee Montgomery, PhD, Consulting Biologist in January 2016. The study summarizes the presence or absence of native species or pest species associated with cattle manure in the general Māhāʻulepū area, as well as the parasites and predators that control those species. No federally or state listed endangered or threatened invertebrate species were noted in the survey of the site. A full report and list of species found on site is provided in EIS Section 4.11 and Appendix B.

Flies were identified on the HDF site using manure from neighboring livestock as bait for invertebrates. The two flies associated with livestock are the stable fly and the horn fly, the latter known for biting cattle. These flies and the greenbottle fly are often confused with the house fly. Flies known to exist on Kauaʻi but not seen at the HDF site include the house fly, the dog dung fly, and the chicken dung fly. These pests are common in areas with high pet populations. It is possible these fly species could inadvertently be brought to the dairy and utilize manure as a food source. HDF will prevent and control fly population growth through diligent clean up and sanitation practices regarding any trash and food waste, as well as through efficient manure composting practices. A full list of site management measures is provided in EIS Section 4.11. The project location does not provide any habitat for *drosophila musaphilia*, the only Kauaʻi species of native Hawaiian fly listed as Endangered or Threatened. Native Drosophila habitat is located many miles away in the high elevation koa-ʻōhiʻa forests.

Fly populations at HDF will be minimized through a process known as Integrated Pest Management (IPM). Essentially, IPM disrupts reproduction with appropriate means at key points in the pest's life cycle. Used in Hawaiʻi for decades, a number of invertebrates and a bird (the cattle egret) were introduced between 1898 and 1950 to reduce livestock-related insects. IPM utilizes knowledge of the ancient food web among species.

An especially important insect to minimize fly breeding habitat in manure is the dung

beetle, which buries manure and incorporates it into the soil. Populations of dung beetles found on Kauaʻi and those species already in Māhāʻulepū Valley, will increase with the increased manure food source, thus increasing and speeding breakdown of manure. Dung beetles are specialists in the very important natural process of breaking up and quickly recycling bovine manure pads. The behavioral diversity among dung beetle species will work together to bury dung pats in one to three days, a shorter amount of time than the 10-30 days flies eggs need to hatch.

In the Kōloa-Poʻipū region, pest fly populations are dependent upon food and breeding sources nearby such as dog, cat, and chicken feces. Beef cattle graze in the region on agricultural lands along Ala Kinoiki Road between Kōloa and Poʻipū, and it is likely the livestock-related flies identified at the HDF site occur in this region as well. Localized controls to reduce pest populations need to address breeding sites in and amongst the food and animals wastes within the area. These mitigation measures will make it difficult for flies to breed, and BMPs will be enforced to address any increase in population, therefore it is expected that the dairy farm will not significantly affect recreational and resort areas.

DEMOGRAPHIC AND ECONOMIC: The potential impacts of Hawai'i Dairy Farms (HDF) to the existing economy were evaluated in the Draft Environmental Impact Statement (EIS), including a fiscal impact assessment report completed in April, 2016 by Plasch Economics Pacific. Draft EIS Section 4.15 addresses demographic and economic factors, with the complete report in Appendix J.

The HDF project would create short-term benefits through jobs for local construction personnel and local material suppliers. Such jobs would include equipment operators, cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, supervisors, painters, etc. Based on State employment multipliers, indirect employment related to Dairy construction would be expected to average about 16 jobs on Kauaʻi, and 8 on Oʻahu. Construction employment would be expected to average about 12 jobs per year during the development period. Thus direct-plus-indirect employment association with construction would be expected to average approximately 36 jobs, of which 28 would be on Kauaʻi.

The HDF project would contribute to diversification of Kauaʻi's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Hawaiʻi Island), approximately10 percent of Hawaiʻi's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and indirect full-time equivalent jobs on Kauaʻi, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on Oʻahu.

HDF is expected to generate a net income of approximately $68,000 to the County when the 699 cow herd is established. When the dairy has matured to full production for the 699 cow dairy, net income to the State is calculated at $160,000

annually. With the potential contemplated herd size of up to 2,000 mature dairy cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be produced. This would double local milk production currently supplied by operational dairies on the Island of Hawai'i.

Additional employment generated by a possible expansion to accommodate the contemplated 2,000 mature dairy cow herd is estimated at approximately 3 construction jobs plus 4 indirect jobs on Kaua'i, and 2 indirect jobs on O'ahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an additional 5 full-time farm jobs would be added, with approximately 15 additional indirect jobs on Kaua'i and another 8 indirect jobs on O'ahu.

The dairy is expected to generate a net additional contribution to the County of approximately $8,000 for improvements related to expansion for the contemplated herd size of up to 2,000 mature dairy cows ($76,000 total versus $68,000 for the committed herd size). The State will derive approximately $360,000 annually in revenues from the contemplated 2,000-mature dairy cow dairy.

Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhā'ulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The

aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhā'ulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Po'ipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhā'ulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawai'i Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhā'ulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhā'ulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhā'ulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water

quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kaua'i community.

Regional Water Demand: The adjacent, developed Kōloa-Po'ipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kaua'i will increase county-wide by 17,300 residents by 2030. The South Kaua'i population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kauai region (the Kōloa - Poi'pū - Kalaheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

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SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhā'ulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhā'ulepū watershed.

The HDF site is located on the bottom-land of the upper Māhā'ulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Ha'upu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhā'ulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kaua'i Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore

recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhā'ulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhā'ulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhā'ulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to

increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhā'ulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Po'ipū region were also calculated. Nitrogen input to the marine environment in the Po'ipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Po'ipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kaua'i community.

AIR QUALITY: As a part of the Environmental Impact Statement (EIS), existing air quality conditions and project impacts were evaluated, including dust and odor. Potential odors and emission levels for air pollutants relevant to dairy operations were modeled, as currently there are no cows on site. EIS sections 4.19 and 4.25 provide an evaluation of air quality and odors, including a windrose depicting wind speed and direction in the area (see DEIS Section 4.1, Climate). The full air quality technical report can be found in Draft EIS Appendix I.

Clean Air Act

Under the *Clean Air Act of 1970* (CAA), amended November 1990, the U.S. Environmental Protection Agency (EPA) regulates both large and small sources of air pollutants by establishing National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. The State of Hawai'i has established its own *State Ambient Air Quality Standards* (SAAQS) that are as strict or, in some cases more strict than the NAAQS. State standards prohibit any visible emissions of fugitive dust from construction activities at the property line.

Emissions relevant to livestock operation include particulate matter and fugitive dust. Greenhouse gases related to dairy cows include methane (CH_4) from enteric fermentation, and both methane and nitrous oxide (N_20) emissions from manure application. No State or Federal regulations for greenhouse gas emissions from farm operations or small businesses currently exist.

DUST

Dust will be generated as cows move along soft limestone walkways that connect the paddocks and lead to and from the milking parlor. Potential fugitive dust emission rates were estimated from published literature, where particulate matter (PM) is measurable from the "drylots" of confined dairy operations where animals walk over dirt and dried manure throughout the day.

Applying the emission rates from this available literature greatly overestimates potential emission resulting from HDF. Cows in the pastoral rotational-grazing system will be on pasture 22 hours each day and will spend two hours – in two separate milking cycles –moving to and from the barn for the 10- to 15-minute milking sessions.

Using atmospheric dispersion modeling system (AERMOD), the rates were scaled to the size of the non-pasture areas used by cows at HDF. Results were added to the

background concentration of particulate matter (both PM_{10} and $PM_{2.5}$) measured on the island of Kaua'i, and the total concentration was compared to the State ambient air quality standards. Only the contemplated herd size of up to 2,000 mature dairy cows was modeled, as at the lower threshold of 699 cows, the potential fugitive dust impact would be negligible. The estimated concentration for PM_{10} is 2.01 $\mu g/m^3$, well below the State standard of 150 $\mu g/m^3$. The estimated concentration for $PM_{2.5}$ is 0.23 $\mu g/m^3$, well below the Federal standard of 35 $\mu g/m^3$ (see Draft EIS Section 4.19 and Table 4-19.2).

ODOR

Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF, so air dispersion models were used to determine potential odor levels. Local weather data was used in conjunction with the AERMOD modeling system, and published rates for manure odors emissions for dairy heifers and effluent ponds were adapted to reflect the HDF facilities.

Odor emission sources identified for modeling at HDF were manure in the pasture fields, irrigation water containing diluted nutrients from effluent, the effluent storage ponds, and the dairy buildings. Odor rates from published research were applied. Odor isopleths (a line used to map all points having the same numerical value) were created to display the model findings. Odor is described in "odor units" at the threshold of perception, which is defined by the point at which 50 percent of panelists, in laboratory conditions, cannot smell the odor but 50 percent of the panelists can detect the odor.

Modeling results were generated for worst case meteorological conditions (low wind velocity / mixing). Generally, tradewinds will disperse odors to less than detectable levels beyond the HDF site; in periods of no wind, odor may not be dispersed creating the "worst case" scenario. In these periods without normal tradewind flow, the odor plume would extend to the south of the HDF site. Sections 4.19.2 and 4.25.2 of the EIS include graphics of the potential odor isopleths.

Results for the committed herd size of 699 mature dairy cows show that odors may be detectable by 50 percent of the sensitive population once per 200 hours, or 44 hours per year, within an area that extends approximately 1,670-feet (within one-third of a mile) beyond the dairy farm boundary, and does not reach recreational or residential areas. Results for the contemplated expanded herd size of up to 2,000 mature dairy cows show odors would not extend beyond 2,780 feet outside the HDF boundary (just over half a mile), again not reaching recreational or residential areas, and again with detection limited to 50 percent of the sensitive population approximately 44 hours per year. The parameters used in the analysis were intentionally conservative, and the impacts shown assume an unlikely confluence of worst-case meteorological data, irrigation location, and grazing location. Actual offsite odor impacts are likely to be much lower and/or less frequent than shown; it is likely odor detection beyond the HDF boundaries will be less frequent.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

From: 8086358777@mms.att.net
Sent: Wednesday, January 28, 2015 7:30 PM
To: EPO; lpdecker@gmail.com

Dear Sirs,

Re: Hawaii Dairy Farms

At that February 2014 informational meeting held at the Koloa Kauai neighborhood center, Hawaii Dairy Farms representative Amy Hennessey told us their proposed dairy for Maha'ulepu valley is modeled after the grass- fed dairies in New Zealand.

Many of New Zealand's streams and rivers are contaminated by the dairy cow urine-manure run off during extreme weather events (heavy rainfall over extended periods) resulting in the poisoning of marine life. Those contaminated rivers and streams flow to the ocean.

New Zealand has closed beautiful beaches and posted health warning signs because the sand is now " impregnated " with dairy cow manure washed up onto their shoreline.

New Zealand was once a beautiful pristine island like Kauai. Kauai, like New Zealand, has extreme weather events (heavy rainfall over extended periods) annually. Therefore Hawaii Dairy Farms should not be permitted to operate a dairy of any size in Maha'ulepu Valley because of location's close proximity to certain south Kauai streams, ocean and beaches.

Hawaii Dairy Farms should be encouraged to submit a different site for their proposed dairy, away from all Kauai's rivers, streams, ocean and beaches, in order to produce milk for Hawaii families.

We Kauai families cherish our pristine beaches and clean ocean, and we all have a duty to protect Kauai's streams, ocean and beaches for Hawaii families.

A dairy operation is not a prudent agricultural proposal for the South Kauai coastal area. Hawaii Dairy Farms recently revised dairy operation proposal continues to lack sound judgement, reasoning and stewardship of Maha'ulepu Valley.

Sincerely,

Lori Decker
2659 Puuholo Road
Koloa HI 96756

Coastline Cottages
2660 Puuholo Road
Koloa HI 96756

February 23, 2015

Laura McIntyre
State of Hawaii Dept of Health
1250 Punchbowl Street
Honolulu HI 96813

Group 70 International
925 Bethel Street 38th Floor
Honolulu HI 96813

Jeff Overton
Hawaii Dairy Farms
PO Box 1690
Koloa HI 96756

RE: Hawaii Dairy Farms Environmental Impact Statement Preparation Notice dated January 2015

Dear Ms McIntyre,

We have been assisting Kauai visitors from all over the world with Poipu accommodations for eighteen years. We have seen economic downturns as a result of the World Trade Center terrorism, massive construction in East Poipu, and the 2008 global financial meltdown. The Poipu visitory industry always recovered due to Poipu's pristine beauty, beautiful clean beaches and ocean, and its unique culture and heritage.

A proposed dairy of any size in Mahaulepu Valley will cause a certain and permanent economic disaster for the Poipu visitor industry. Word will quickly spread on social media not to go to Poipu – It stinks. Why would visitors come to Poipu? There are many other beautiful places to relax by a pool or on a beach that don't stink or have flies.

There will be certain noise pollution from crying dairy cows and calves during Poipu's quiet nights. There will be certain noise and light pollution from the proposed milking parlor during Poipu's dark nights and early mornings.

Please accept this letter as our written request that air pollution, noise pollution, light pollution, water pollution, water usage, and economic harm to local Poipu businesses and workers caused by an industrial dairy in nearby Malaulepu Valley all need to be addressed and answered by the EIS.

Sincerely,

Lori Decker
President

James Design Shoppe of Hawaii Ltd
PO Box 1214
Koloa HI 96756

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FEB 25 2015
GROUP 70 INTL

February 23, 2015

Laura McIntyre
State of Hawaii Dept of Health
1250 Punchbowl Street
Honolulu HI 96813

Group 70 International
925 Bethel Street 38th Floor
Honolulu HI 96813

Jeff Overton
Hawaii Dairy Farms
PO Box 1690
Koloa HI 96756

RE: Hawaii Dairy Farms Environmental Impact Statement Preparation Notice dated January 2015

Dear Ms McIntyre,

Our corporation was formed in Hawaii in 1980 for the purpose of owning Kauai real estate. The corporation currently owns a vacation rental home in the Poipu Kai Resort near the Grand Hyatt Kauai. That vacation rental home is designed for natural cooling. The cool trade winds blow through the home 80% of the year.

The air quality problems caused by gases emitted from the decomposition of dairy cow wastes and by the dust generated by animal activity and farming practices are well documented. We know these air pollutants can cause respiratory illness, lung inflammation and increase vulnerability to respiratory diseases like asthma.

Please accept this letter as our written request for you to ensure 1) the certain air pollution produced by the proposed dairy located directly **upwind** of our residential neighborhood, and 2) the certain economic harm to the **existing** Poipu property owners caused by the **proposed** for-profit industrial dairy located directly upwind of our residential neighborhood, be addressed and answered by the EIS.

Specifically the EIS should address the direct public health and economic harm from a 150, 300. 699 and a 2000 dairy cow operation. Also, the EIS should address the distance aerosolized manure and urine will travel with Kauai trade winds when effluent is spread through overhead irrigation.

Sincerely,

Lori Decker
President

GROUP 70 INTERNATIONAL

May 26, 2016

Lori Decker
2659 Puuholo Road
Koloa, HI 96756
ipdecker@gmail.com

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Lori Decker:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

DAIRY OPERATIONS: Hawai'i Dairy Farms (HDF) will establish and operate a sustainable, pastoral rotational-grazing dairy farm in Māhā'ulepū Valley on the island of Kaua'i to produce fresh, locally available nutritious milk for Hawai'i families. The rotational-grazing method utilizes 100 percent of the cows' manure as natural fertilizer to grow pasture grass as a primary source of nutrition for dairy cows. This cost-effective method will reduce reliance on imported fertilizer and feed. Pasture grass will comprise at least 70 percent of the animals' diet. As a part of the Draft Environmental Impact Statement (EIS), the proposed facilities and operations for the dairy farm are described in Chapter 3.

The Environmental Impact Statement (EIS) Preparation Notice (EISPN), published January 23, 2015, described the proposed pasture-based rotational grazing system

as a "zero-discharge, grass-fed dairy". The term "zero-discharge" under the U.S. Environmental Protection Agency related to concentrated feeding operations (CAFO) is a system designed to not discharge pollutants into waters of the United States. As noted previously, the HDF system is designed to utilize 100 percent of the cows' manure on-site. However, nutrients would be introduced to the HDF site with any use; the Draft EIS identifies the amount of nutrients anticipated from the proposed dairy operations that could pass through to ground and surface waters. Therefore, HDF elected to discontinue use of the term "zero discharge" as it was construed as no nutrients into the system.

The term "grass-fed" was used in the HDF EISPN. This term was used to identify HDF's intent to utilize a locally-produced feedstock – grass – for more than 70 percent of the dairy herds' diet. In January 2016, the U.S. Department of Agricultural (USDA) Marketing Survey created a narrow legal definition of "grass-fed". The USDA standard defines what animals can and cannot be fed. The Food Alliance, a project of several northwest colleges, believes that when consumers choose grass-fed products there is an expectation that these will come from animals raised on pasture on a forage-based diet. Due to the evolving definition of "grass-fed", the term in not used in this EIS.

The dairy facilities will occupy an area of approximately 10 acres on the western boundary of the site. The developed area "footprint" will be less than 2 percent of the total farm area. Four buildings will be constructed to serve different functions, supported by utilities and infrastructure. Additional building information can be found in Draft EIS Section 3.3.1.

Agricultural infrastructure and utilities required for the dairy operations will include storage tanks and silos, effluent storage ponds, livestock water systems, and drainage improvements. The irrigation system and distribution of livestock water are discussed in Draft EIS Section 3.5, Pasture Management.

The pastoral rotational-grazing dairy provides a local feedstock – grass – as the herd's primary food source. Reducing imported feed stabilizes costs and provides a food source closer to the natural diet of cows. Results of grass trials initially conducted at five sites across four Hawaiian Islands were instrumental in identifying appropriate varieties of grass, and suitable sites to support sufficient "dry matter" grass yields essential to a cow's diet. Additional project-specific trials at the Māhāʻulepū site on Kauai have been conducted for more than 18 months. The results have identified sufficient yield and nutrition to supply 70 percent of the cows' diet; improvements in grass productivity are anticipated to provide up to 85 percent of cows' diet.

The pasture-based model allows cows to move about freely, and to lie down and rest, which is part of the digestion cycle. The animals are managed in social groups known as "mobs", mimicking the natural social order of bovines. Cows spend 22 hours of each 24-hour period foraging on pasture or resting, outdoors in natural light and fresh air. The gently sloped paddocks, walkways and races minimize the energy expended by the mature dairy cows as they graze or are transferred to and from the various paddocks and the mature dairy facility; surfaces of the walkways

and cow races are designed to provide a comfortable path under hoof. The management practices and pasture model applied by HDF maximizes grass as the cows' primary nutrition source and minimizes stress to the animals. Cows tend to be healthier and live longer, productive lives with access to fresh air, high quality feed, and exercise while they forage.

The 470 acres of pasture will be divided into paddocks averaging 3 to 5 acres in size. Smaller paddocks located near the dairy facility will be used as temporary pasture for cows or calves being moved on or off the farm. To protect the water quality of surface water and downstream areas, paddock fences are set back 35 feet from the edge of drainage ways throughout the site. Existing vegetation within the setbacks will be managed or restored to reduce erosion, improve stability of ditch banks, increase net carbon storage, and improve and maintain water quality.

The majority of the pastures will be irrigated with non-potable water and/or diluted effluent through either the pivot irrigation systems or through gun irrigators. Irrigation water supply is provided to the farm from Waita Reservoir, and will be filtered and pumped to the various irrigation components on the farm. The irrigation system is controlled using computer software and GPS receivers to allow very precise application of irrigation and/or diluted effluent on the pasture. The pivots can rotate and apply irrigation water and/or diluted effluent at different rates depending on the actual irrigation needs of the farm.

NRCS provides technical guidance on applying agricultural waste depending on the desired use of the waste. Reflected in the title of the livestock waste guidance for Hawaiʻi is the parenthetical inclusion of the word "nutrients." Where waste is utilized as a resource, it is being used for the constituent components that provide benefit.

The NRCS Conservation Practice Standard 590, Nutrient Management, applies to commercial fertilizers, organic by-products, waste water, organic matter, and irrigation water. Nutrient management is the practice of managing the amount, rate, source, method of application, and timing of plant nutrients and soil amendments. The timing and application of nutrients will correspond with plant uptake, soil properties and weather conditions. For more information on nutrient balance management see Draft EIS Section 3.5.3, and Draft EIS Appendix D.

The effluent storage ponds are sized to accommodate 30 days of storage for up to 2,000 mature dairy cows, and over 85 days of storage for 699 mature dairy cows. It will be highly unlikely that the storage pond will be full at any time for the contemplated 2,000-cow dairy, and nearly impossible for the committed 699-cow dairy. Throughout the less than 30-day storage period, effluent is planned for application every four days, and the slurry application is expected at least once every 45 days, to ensure that the ponds are kept at manageable levels.

Cows lactate milk following the birth of calves. Newborn calves will be housed on the Māhāʻulepū site and provided essential colostrum and nutrients for a healthy start. During the calves' initial 90 days, they will be transitioned to pasture at HDF before transfer to ranches on Kauaʻi to be raised off-site. The committed herd size of

699 mature dairy cows at the Māhāʻulepū site applies to mature mature dairy cows. Animals in various stages of lactation and rest will be transferred between HDF and other partner ranches as needed for animal health and dairy productivity. This will benefit both the dairy and infuse the beef market in Hawaiʻi with a new, local source of pasture-raised calves. Male calves will become part of the beef cattle herd; heifers (young female calves that haven't given birth) will be raised until ready to return to the HDF herd as a birthing/mature dairy cow. For more information on off-site herd management, refer to Section 3.7 of the Draft EIS.

Health of the herd is of primary importance as the success of a dairy relies on cows effectively producing quality milk. All cows will be treated with a high standard of care. Dairy managers and caretakers will be trained and competent in handling animals to minimize stress and ensure the herds' welfare. A licensed veterinarian may prescribe use of antibiotics approved by the Food & Drug Administration (FDA) for treatment of illnesses. Adherence to guidelines that prohibit milk from cows undergoing antibiotic treatment will ensure no adulteration of milk. Routine laboratory tests of milk for traces of antibiotic residue will be conducted. HDF will not inject cows with bovine growth hormone, referred to as rBST or rBGH.

INVERTEBRATE SPECIES: A study of invertebrate species and pest insects was conducted by Steven Lee Montgomery, PhD, Consulting Biologist. The study summarizes the presence or absence of native species or pest species associated with cattle manure in the general Māhāʻulepū area, as well as the parasites and predators on site that control those species. Fieldwork was conducted during September 15-16, 2014. The entire study is included in Draft Environmental Impact Statement (EIS) as Appendix B.

CAVE AND LAVA TUBE INVERTEBRATES

There are no known caves or lava tubes found at or adjacent to the dairy farm property. The Kōloa Lava Tube System, which provides habitat for two endemic cave species, the Kauaʻi Cave Wolf Spider and the Kauaʻi Cave amphipod, is located several miles away from the dairy farm property. Both invertebrates are listed as endangered under the U.S. Endangered Species Act. Not all caves in the Kōloa area contain these invertebrates, as many do not contain the optimal climatological conditions required by these organisms. Neither the botanical and faunal survey nor the invertebrate survey revealed any evidence of lava tubes or caves on the property, and no such features have been reported for the area near the Hawaiʻi Dairy Farms (HDF) site. Thus no cave invertebrate species will be affected by the dairy farm.

INTRODUCED PREDATOR INSECTS

An invertebrate study of manure-associated insects was conducted for the Draft EIS. The study included a field survey that used manure from an adjacent beef cattle herd as a lure, and determined flies and other manure-related insects currently present at the HDF site. Pest insects such as flies can negatively impact livestock health and production, and are therefore actively managed to prevent stress and loss of productivity at dairy operations.

At the HDF site, two common flies were identified: the stable fly and the horn fly. Both of these flies are widespread throughout the Hawaiian Islands. The greenbottle fly was reared from manure taken back to a laboratory following the field survey. Additionally, flies known to exist on Kauaʻi but not seen at the HDF site during the survey were identified and include the house fly, the dog dung fly, and the chicken dung fly. These pests are common in areas with high pet populations.

In response to cattle-related insect pests, numerous species known to compete with the pests were introduced to Hawaiʻi between 1898 and 1982. Twenty species of predators and competitors to the horn fly were successfully established during that period. Cattle egrets break up dung patties while searching for prey, and were introduced to Hawaiʻi in the late 1950s to control cattle-associated insects. Extensive introduction of dung beetle species resulted in 14 dung beetle species becoming established on Kauaʻi.

A healthy population of dung beetles can bury a dung pat in one to three days, which disrupts reproduction of flies such as the stable fly and horn fly. The stable fly requires approximately 21 days within the dung patty for the immature life stage (egg to pupa) to survive; the horn fly takes 10 to 20 days from egg to adult. Incorporation of the manure into the soil profile by dung beetles removes the habitat these flies require to complete their lifecycle. Research shows that 95 percent fewer horn flies emerged from dung patties containing a dung beetle species that has been identified at the HDF site. Proven control methods for the stable fly include parasitic micro-wasps and spreading out manure.

Among the invertebrates previously introduced to Hawaiʻi to combat livestock-related flies are extremely tiny parasitic wasps that prey on various fly species. The adult wasps could be described as the size of gnat. Using an ovipositor – described by lay people as a "stinger" – the female lays eggs in the larvae or pupa of flies. The male wasp has no such "stinger". See Draft EIS Section 4.11 for a photo providing scale for these tiny, non-stinging wasps.

To minimize potential establishment of pest flies or other insects, food waste generated during the construction phase will be bagged, covered, contained and disposed of in order to limit possible breeding habitat for flies. Inspections of building materials for ants or other insects will be conducted to prevent introduction of new pests to the HDF site. Short-term controls, including mechanical methods (e.g. sticky tapes or ribbons in the milking parlor, or traps with or without attractants) and chemical methods may be used to prevent short-term spikes in pest populations.

Insecticides and herbicides are non-discriminatory and kill beneficial as well as pest insects. Beneficial insects include primary decomposers such as earthworms and dung beetles, and pollinators including bees. Should chemical control be needed for short-term spikes in pest populations, application would be by those qualified, and in accordance with regulatory labeling requirements. HDF will implement long-term integrated pest management, which utilizes knowledge of the ancient food web among species by disrupting the manure habitat required to complete the fly life cycle. HDF and other ranchers on Kauaʻi may choose to engage with the State

Department of Agriculture to translocation dung beetle species already introduced on Kaua'i to Māhā'ulepū and other areas where manure-related flies may be a problem.

IMPACT OF SPRAYS ON BEES

Beneficial insects include primary decomposers such as earthworms and dung beetles, and pollinators including bees. Honey bees are an essential part of any agricultural ecosystem, and were observed on site during the invertebrate species survey. Pesticides and herbicides can reduce populations of beneficial insects, which is why HDF will utilize an integrated pest management approach.

It is expected that honey bees will visit water sources set up for the HDF herd. Preventative measures will be built into any open water source to prevent bees from being trapped, and HDF will contact local beekeepers for advice regarding any bees or bee colonies encountered on site. Safe application practices for any unavoidable herbicide or pesticide will be utilized in order to narrowly target the correct pest species without harming other insects and animals in the area. Anyone using herbicides or pesticides will be properly trained and informed, and if a honey bee colony location appears to be a danger to workers or cattle, or to be in danger itself, a local beekeeper will be contacted for advice and removal.

NOISE: Existing noise conditions of the project site and the surrounding Māhā'ulepū valley area are evaluated in the Draft Environmental Impact Statement (EIS), along with anticipated short-term and long-term noise conditions associated with the dairy farm and planned mitigation actions. Draft EIS Section 4.12 addresses noise conditions.

Noise can be defined as unwanted sound, a sound that is considered loud or unpleasant, and/or sound that causes disturbance. Research related to noise and livestock focuses on noise levels and minimization of unexpected sounds that cause undue stress on cows. Noise stress results in loss of livestock productivity and thereby financial loss to farmers and ranchers. Little research exists on the sound levels from livestock.

Sound is measured in decibels (dB). The State of Hawai'i Department of Health (DOH) rules use the A-weighting sound network (dBA) in the HAR §11-46, Community Noise Control. Sound through the air is similar to ripples on a pond of water. In open space without reflection, ripples spread uniformly in all directions and decrease in amplitude further from the source. In free field conditions such as outdoors, amplitude drops by half as distance doubles (OSHA, 2016). When sound passes close to absorbing ground cover such as grassland and fields, the "soft ground" absorbs extra sound as it passes. The Hawai'i Dairy Farms (HDF) site in Māhā'ulepū Valley is approximately 2 miles from the resort area, and 1.5 miles from the closest residential areas (on land zoned for agriculture). Typical noise currently generated near the HDF site includes truck ingress/egress along private farm roads, agricultural equipment, and cattle and sheep.

Construction work at the project site will involve activities that may generate an increase in noise levels. However, such exposures will be a short-term condition, occurring during daylight hours. Construction vehicles and activities must comply with DOH Administrative Rules. DOH noise control regulation requires a permit for construction activities that emit noise in excess of 78 decibels or that cost a total of more than $250,000. Mitigation measures to minimize construction noise will include the use of mufflers to suppress loud equipment and limitations on the hours of heavy equipment operation.

The dairy farm will utilize milking equipment contained in the milking parlor, and will use field equipment such as tractors. Under HAR §11-46, agriculture is classified as Zoning District Class C, which specifies maximum permissible sound levels of 70 dBA in the daytime and 70 dBA at nighttime. Dairy operations will generate noise in keeping with agricultural zoning of the parcel. The primary noise receptors in the area would be farmers working nearby parcels. Noise from the dairy will not exceed the DOH threshold, and will not contribute to excessive noise in the region.

DEMOGRAPHIC AND ECONOMIC: The potential impacts of Hawai'i Dairy Farms (HDF) to the existing economy were evaluated in the Draft Environmental Impact Statement (EIS), including a fiscal impact assessment report completed in April, 2016 by Plasch Economics Pacific. Draft EIS Section 4.15 addresses demographic and economic factors, with the complete report in Appendix J.

The HDF project would create short-term benefits through jobs for local construction personnel and local material suppliers. Such jobs would include equipment operators, cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, supervisors, painters, etc. Based on State employment multipliers, indirect employment related to Dairy construction would be expected to average about 16 jobs on Kaua'i, and 8 on O'ahu. Construction employment would be expected to average about 12 jobs per year during the development period. Thus direct-plus-indirect employment association with construction would be expected to average approximately 36 jobs, of which 28 would be on Kaua'i.

The HDF project would contribute to diversification of Kaua'i's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Hawai'i Island), approximately10 percent of Hawai'i's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and indirect full-time equivalent jobs on Kaua'i, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on O'ahu.

HDF is expected to generate a net income of approximately $68,000 to the County when the 699 cow herd is established. When the dairy has matured to full production for the 699 cow dairy, net income to the State is calculated at $160,000

annually. With the potential contemplated herd size of up to 2,000 mature dairy cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be produced. This would double local milk production currently supplied by operational dairies on the Island of Hawai'i.

Additional employment generated by a possible expansion to accommodate the contemplated 2,000 mature dairy cow herd is estimated at approximately 3 construction jobs plus 4 indirect jobs on Kaua'i, and 2 indirect jobs on O'ahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an additional 5 full-time farm jobs would be added, with approximately 15 additional indirect jobs on Kaua'i and another 8 indirect jobs on O'ahu.

The dairy is expected to generate a net additional contribution to the County of approximately $8,000 for improvements related to expansion for the contemplated herd size of up to 2,000 mature dairy cows ($76,000 total versus $68,000 for the committed herd size). The State will derive approximately $360,000 annually in revenues from the contemplated 2,000-mature dairy cow dairy.

Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhā'ulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The

aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhā'ulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Po'ipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhā'ulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawai'i Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhā'ulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhā'ulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhā'ulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water

quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kaua'i community.

Regional Water Demand: The adjacent, developed Kōloa-Po'ipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kaua'i will increase county-wide by 17,300 residents by 2030. The South Kaua'i population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kaua'i region (the Kōloa - Po'ipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhā'ulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhā'ulepū watershed.

The HDF site is located on the bottom-land of the upper Māhā'ulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Ha'upu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhā'ulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kaua'i Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi

Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhā'ulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhā'ulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhā'ulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural

fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Poʻipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water

masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kauaʻi community.

AIR QUALITY: As a part of the Environmental Impact Statement (EIS), existing air quality conditions and project impacts were evaluated, including dust and odor. Potential odors and emission levels for air pollutants relevant to dairy operations were modeled, as currently there are no cows on site. EIS sections 4.19 and 4.25 provide an evaluation of air quality and odors, including a windrose depicting wind speed and direction in the area (see DEIS Section 4.1, Climate). The full air quality technical report can be found in Draft EIS Appendix I.

Clean Air Act

Under the *Clean Air Act of 1970* (CAA), amended November 1990, the U.S. Environmental Protection Agency (EPA) regulates both large and small sources of air pollutants by establishing National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. The State of Hawaiʻi has established its own *State Ambient Air Quality Standards* (SAAQS) that are as strict or, in some cases more strict than the NAAQS. State standards prohibit any visible emissions of fugitive dust from construction activities at the property line.

Emissions relevant to livestock operation include particulate matter and fugitive dust. Greenhouse gases related to dairy cows include methane (CH_4) from enteric fermentation, and both methane and nitrous oxide (N_20) emissions from manure application. No State or Federal regulations for greenhouse gas emissions from farm operations or small businesses currently exist.

DUST

Dust will be generated as cows move along soft limestone walkways that connect the paddocks and lead to and from the milking parlor. Potential fugitive dust emission rates were estimated from published literature, where particulate matter (PM) is measurable from the "drylots" of confined dairy operations where animals walk over dirt and dried manure throughout the day.

Applying the emission rates from this available literature greatly overestimates potential emission resulting from HDF. Cows in the pastoral rotational-grazing system will be on pasture 22 hours each day and will spend two hours – in two

separate milking cycles –moving to and from the barn for the 10- to 15-minute milking sessions.

Using atmospheric dispersion modeling system (AERMOD), the rates were scaled to the size of the non-pasture areas used by cows at HDF. Results were added to the background concentration of particulate matter (both PM_{10} and $PM_{2.5}$) measured on the island of Kaua'i, and the total concentration was compared to the State ambient air quality standards. Only the contemplated herd size of up to 2,000 mature dairy cows was modeled, as at the lower threshold of 699 cows, the potential fugitive dust impact would be negligible. The estimated concentration for PM_{10} is 2.01 $\mu g/m^3$, well below the State standard of 150 $\mu g/m^3$. The estimated concentration for $PM_{2.5}$ is 0.23 $\mu g/m^3$, well below the Federal standard of 35 $\mu g/m^3$ (see Draft EIS Section 4.19 and Table 4-19.2).

ODOR

Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF, so air dispersion models were used to determine potential odor levels. Local weather data was used in conjunction with the AERMOD modeling system, and published rates for manure odors emissions for dairy heifers and effluent ponds were adapted to reflect the HDF facilities.

Odor emission sources identified for modeling at HDF were manure in the pasture fields, irrigation water containing diluted nutrients from effluent, the effluent storage ponds, and the dairy buildings. Odor rates from published research were applied. Odor isopleths (a line used to map all points having the same numerical value) were created to display the model findings. Odor is described in "odor units" at the threshold of perception, which is defined by the point at which 50 percent of panelists, in laboratory conditions, cannot smell the odor but 50 percent of the panelists can detect the odor.

Modeling results were generated for worst case meteorological conditions (low wind velocity / mixing). Generally, tradewinds will disperse odors to less than detectable levels beyond the HDF site; in periods of no wind, odor may not be dispersed creating the "worst case" scenario. In these periods without normal tradewind flow, the odor plume would extend to the south of the HDF site. Sections 4.19.2 and 4.25.2 of the EIS include graphics of the potential odor isopleths.

Results for the committed herd size of 699 mature dairy cows show that odors may be detectable by 50 percent of the sensitive population once per 200 hours, or 44 hours per year, within an area that extends approximately 1,670-feet (within one-third of a mile) beyond the dairy farm boundary, and does not reach recreational or residential areas. Results for the contemplated expanded herd size of up to 2,000 mature dairy cows show odors would not extend beyond 2,780 feet outside the HDF boundary (just over half a mile), again not reaching recreational or residential areas, and again with detection limited to 50 percent of the sensitive population approximately 44 hours per year. The parameters used in the analysis were intentionally conservative, and the impacts shown assume an unlikely confluence of

worst-case meteorological data, irrigation location, and grazing location. Actual offsite odor impacts are likely to be much lower and/or less frequent than shown; it is likely odor detection beyond the HDF boundaries will be less frequent.

ALTERNATIVES: As a part of the DEIS, alternatives were evaluated that could attain the objectives of the action's purpose and need, and were compared with environmental benefits, costs, and risks of each reasonable alternative against those of the proposed dairy project. Further discussion of alternatives can be found in DEIS Section 6.

The DEIS evaluates alternatives that could attain the objectives of the action's purpose and need, and compares environmental benefits, costs, and risks of each reasonable alternative against those of the proposed action. Additionally, reasonable land use alternatives that emerged from public input during the project scoping phase are documented and briefly discussed. The alternatives that do not meet the project purpose are not advanced for analysis of environmental benefits, costs, and risks. The Environmental Impact Statement Rules, Hawai'i Administrative Rules Chapter 11-200 (HRS 11-200) requires a discussion of alternatives that could attain the objectives of the action, regardless of cost. There is no requirement for the alternatives analysis to consider every possible land use.

Four possible land uses that would not meet the project purpose are discussed. Rezoning the land for resort or residential development, or a potential conservation condemnation are two uses that were examined and eliminated from analysis. These options would not be reasonably viable given the existing private land tenure and existing zoning. Two additional alternatives were considered as reasonable land uses as they could be permitted within the existing State Land Use Agricultural District and County Agricultural Zoning District. These options include Agricultural Park with Processing Center, and development of an Agricultural Subdivision. The alternatives were examined and eliminated from further analysis, however, as they would not fulfill the project purpose.

The analysis, therefore, focuses on alternatives that meet the project purpose. Rigorous exploration and evaluation of the environmental impacts of the alternatives, including those that might enhance environmental quality or avoid, reduce or minimize some or all of the adverse environmental effects, costs and risks. These alternatives include: (1) the development of a Conventional Feedlot Dairy (a non-pasture-based dairy) at the same location; (2) development of the Pasture-Based Dairy at an Alternative Location on Kaua'i; and (3) milk products processing by HDF. The alternative of "No Action" is also evaluated.

The alternatives analysis provides a comprehensive evaluation of the range of potential alternatives, including the two alternative development scenarios. Although the alternatives are potentially reasonable uses under existing zoning and neighboring uses, each fails to comprehensively fulfill the project requirements defined by the eight Project Objectives and the four established Evaluation Criteria (Chapter 2, Sections 2.3.3 and 2.3.4).

The essential differences as compared to the proposed action are highlighted in the following statements.

- Only one of the alternative actions (conventional feedlot alternative) would create a commercial scale dairy operation in Hawai'i, with the capability to produce 10 percent of the State's fresh milk demand thus reducing dependence on imported milk (Objective 1). This alternative, however, would not reduce reliance on costly imported fertilizer and feed (Objective 2); grow local, quality grass as a primary feedstock (Objective 3); and would not utilize 100 percent of manure on site as nutrients to grow forage for dairy cows (Criterion 4).
- None of the alternatives would secure a dairy location that meets the requirements for a pastoral, pasture-based grazing dairy: sufficient contiguous land area; available long-term land tenure; adequate potable water supply; suitable soil properties; gentle slope conditions; and accessibility (Criterion 1).
- One alternative (Agricultural Park) could potentially generate new long-term employment in the agricultural sector on Kaua'i in a wide range of positions including pasture agronomy/soils science, environmental resources management (Criterion 2).
- The Agricultural Park alternative could also develop sustainable food production utilizing Important Agricultural Lands, demonstrating the importance of long-term agricultural leases and capital investment for agricultural infrastructure, water systems and support facilities. (Criterion 3). However, after years of trying, it appears there was limited interest in such a venture.
- Finally, addressing the range of potential environmental impacts (natural, cultural, social and economic) (Objective 8) the two alternative development scenarios would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.

In contrast to the other options considered, the planned agricultural operation of Hawai'i Dairy Farms, was determined to be the most viable option and is the preferred alternative. Of all the alternatives considered, this is the only approach that achieves project objectives and meets each of the four Evaluation Criteria.

- Hawai'i Dairy Farms will create a commercial scale pasture-based dairy operation in Hawai'i, with the capability to provide more than 1,000,000 gallons of the fresh milk demand, reducing dependence on imported milk (Objective 1).
- The planned dairy location meets the requirements of minimum land area, soil properties, slope conditions, water supply, land tenure and availability, and accessibility (Criterion 1).
- The planned action will generate new long-term employment in the agricultural sector on Kaua'i, including pasture agronomy/soils science, veterinary and animal husbandry, environmental resources management, milk/milk processing, and dairy business management (Criterion 2).

- Sustainable food production utilizing Important Agricultural Lands (Criterion 3) will occur with the proposed action, demonstrating the importance of long term agricultural leases, and the ability to draw capital investment for agricultural infrastructure including water systems and support facilities (Criterion 3).
- Address the range of potential environmental impacts by utilizing 100 percent of manure as natural fertilizer to grow the majority of food for cows (Criterion 4). The alternatives evaluated would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.
- Creating an economically viable pasture rotational-grazing model maintains agriculture, retains open space, and provides buffer between highly utilized resort and residential development and sensitive natural or cultural resources (Objective 8).

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

Catherine DeMichiel
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February 22, 2015

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RE: RESPONSE TO PROPOSED ENVIRONMENTAL IMPACT STUDY

To Whom It May Concern:

As a resident of a home in the Po'ipu area I am extremely concerned about the environmental impact that HDF proposed dairy in Mahale'upu area will have on this pristine area. I feel it is imperative that I voice my strong objections to the proposed Hawaii Dairy Farm. As a travel professional I feel certain that the proposed HDF will profoundly and adversely affect tourism to Kauai. Should this happen many more jobs from the tourism industry will be lost compared to the very few created by the HDF.

The area of Mahale'upu in question is the oldest geological area in the entire state of Hawaii. It is an archeological area of significant importance. For that reason alone it should be preserved. It has great cultural, spiritual and historic significance to the Hawaiian people and her culture, another reason for preservation of the area. This astoundingly beautiful area must be preserved.

The HDF dairy will undoubtedly affect the water quality of the stream that flows to the ocean. Pollution of the stream, land, watershed and ocean needs to be avoided at all cost!! Gravity will pull the polluted water runoff toward the ocean and kill the reef which is essential to support our fisherman, scuba divers and snorkelers as well as the pristine Mahale'upu beach. Loss of the coral reef is another example of the way we will lose tourists. When we lose tourism, we LOSE JOBS.

The EIS must include a study of the impact of HDF's trucks and traffic in and out of the Po'ipu area. HDF trucks will be hauling feed and fertilizer (as explained by HDF representative in the community meeting Feb 19). Trucks going in and out of the area will be carrying tanks full of milk as well as the empty trucks returning. Trucks will be going in/out of Po'ipu area carrying all the chemicals needed to clean the stalls twice each day and insecticides necessary for the cows. A traffic study must be done as to our current traffic and the increased traffic HDF would impose on the area. Our roads will suffer under the added weights of their trucks. Will HDF repair our roads? Along with the trucks will be their noise and air pollution. Please address the important issue of truck traffic in/out of the area.

Milking stalls need to be thoroughly cleaned twice each day with harsh chemicals that will pollute the stream, watershed and run off into the ocean.

Air quality will be adversely affected by the trucks and the manure and anticipated collection ponds. With the manure will come the flies. Air and water will become polluted. I have been told the ponds will be lined with heavy plastic. There is no plastic on earth that will hold up to our hot, humid island conditions. What is the plan for overflow during our heavy rains and deterioration of the plastic pond liners?

Are we to believe that after the milk has gone to Oahu for pasteurization and bottling, it will return back to Kauai at an affordable price? If yes, the truck traffic would be increased even more. Have you seen the traffic problems that already exist on the island?

The EIS must also address the issue of flies and air pollution from the stench of the manure. It has been determined that the soil in the area is not absorbent meaning the cow urine as well as rain water will run off into the stream and ultimately end up on the ocean. What a travesty to think of the pristine Mahale'upu beach as a cesspool of cow droppings.

Please consider a different area for HDF's project that will not adversely affect the long established environmentally friendly way of life on Kauai.

Sincerely,

Catherine DeMichiel

Catherine DeMichiel,

Travel Consultant

Island Palms to Pines Travel

GROUP 70 INTERNATIONAL

May 26, 2016

Catherine DeMichiel
1831 Poipu Road
Koloa, HI 96756

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Catherine DeMichiel:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

ARCHAEOLOGICAL AND CULTURAL: The Hawai'i Dairy Farms (HDF) project is subject to a historic preservation review by the State Department of Land and Natural Resources, State Historic Preservation Division (SHPD) under HRS Chapter 6E and Chapter 13-284. An Archaeological Inventory Survey (AIS) and a Cultural Impact Assessment (CIA) were conducted by Scientific Consultant Services (SCS) for the proposed project. EIS Sections 4.7 and 4.8 provide an evaluation of archaeology and cultural resources, with technical studies in Appendix G and H.

A total of sixteen historic properties were identified through a pedestrian survey of the project area and an extended survey area of 100 meters of the northern boundary. Six historic-era sites occur in the project area and 10 sites occur in the extended survey area. Only one of the sites is believed to be associated with pre-Contact and/or early historic times. State Site 50-30-10-2250, the agricultural heiau,

and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area. The remaining sites consist of historic-era bridges, ditches, culverts, retaining walls, and a flume system dating from the 20th century and are affiliated with sugarcane cultivation.

That a majority of the documented sites are related to the historic-era is not surprising, given the massive landscape modifications that occurred during intensive sugarcane cultivation on the valley floor. Even historic era cultural materials associated with the many Land Commission Awards in the project area were non-existent, as explored through survey and subsurface exploration.

The sixteen historic properties have been assessed for significance by the archaeological consultant and the dairy project is anticipated to have no impact on these sites. No further archaeological work is recommended for the sites. Two of the sixteen sites are considered significant under multiple criteria, but occur outside the project area on lands owned by a different landowner. Both sites will not be adversely affected by the proposed dairy project. No site is related to burials, and no bonex were found. Such sites have been reported along coastal areas in sand dunes.

The cultural assessment examined the potential effect of the project on cultural resources, practices or beliefs, its potential to isolate cultural resources, practices or beliefs from their setting, and the potential of the project to introduce elements which may alter the setting in which cultural practices take place. Information received from the community indicates the Māhāʻulepū Ahupuaʻa, has been and is currently used for traditional cultural purposes. However, the dairy project area has not been included in these activities. It is clear that the gathered plants, trails, State Site 50-30-10-2250, the agricultural heiau, and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area.

The project will be fully enclosed by perimeter fencing along the boundary of the leased premises, which will ensure that project activities and any related impacts are contained within the project area. Based on the research and comments received from the community, it is reasonable to conclude that, pursuant to Act 50, the exercise of native Hawaiian rights or any ethnic group related to numerous traditional cultural practices will not be impacted by establishment of the dairy.

DEMOGRAPHIC AND ECONOMIC: The potential impacts of Hawai'i Dairy Farms (HDF) to the existing economy were evaluated in the Draft Environmental Impact Statement (EIS), including a fiscal impact assessment report completed in April, 2016 by Plasch Economics Pacific. Draft EIS Section 4.15 addresses demographic and economic factors, with the complete report in Appendix J.

The HDF project would create short-term benefits through jobs for local construction personnel and local material suppliers. Such jobs would include equipment operators, cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, supervisors, painters, etc. Based on State employment multipliers, indirect employment related to Dairy construction would be expected to average about 16 jobs on Kaua'i, and 8 on O'ahu. Construction employment would be expected to average about 12 jobs per year during the

development period. Thus direct-plus-indirect employment association with construction would be expected to average approximately 36 jobs, of which 28 would be on Kaua'i.

The HDF project would contribute to diversification of Kaua'i's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Hawai'i Island), approximately10 percent of Hawai'i's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and indirect full-time equivalent jobs on Kaua'i, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on O'ahu.

HDF is expected to generate a net income of approximately $68,000 to the County when the 699 cow herd is established. When the dairy has matured to full production for the 699 cow dairy, net income to the State is calculated at $160,000 annually. With the potential contemplated herd size of up to 2,000 mature dairy cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be produced. This would double local milk production currently supplied by operational dairies on the Island of Hawai'i.

Additional employment generated by a possible expansion to accommodate the contemplated 2,000 mature dairy cow herd is estimated at approximately 3 construction jobs plus 4 indirect jobs on Kaua'i, and 2 indirect jobs on O'ahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an additional 5 full-time farm jobs would be added, with approximately 15 additional indirect jobs on Kaua'i and another 8 indirect jobs on O'ahu.

The dairy is expected to generate a net additional contribution to the County of approximately $8,000 for improvements related to expansion for the contemplated herd size of up to 2,000 mature dairy cows ($76,000 total versus $68,000 for the committed herd size). The State will derive approximately $360,000 annually in revenues from the contemplated 2,000-mature dairy cow dairy.

Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E

and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhāʻulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhāʻulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Poʻipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhāʻulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawaiʻi Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhāʻulepū 14 well during the sugarcane

plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhāʻulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhāʻulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kauaʻi community.

Regional Water Demand: The adjacent, developed Kōloa-Poʻipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kauaʻi will increase county-wide by 17,300 residents by 2030. The South Kauaʻi population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kauaʻi region (the Kōloa - Poʻipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhāʻulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhāʻulepū watershed.

The HDF site is located on the bottom-land of the upper Māhāʻulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Haʻupu Ridge. These normally dry streams converge into man-made channels running

through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhāʻulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kauaʻi Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhāʻulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhāʻulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhāʻulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or

maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater

and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Po'ipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kaua'i community.

TRAFFIC: The Draft Environmental Impact Statement (EIS) Section 4.18 and 4.25 includes an evaluation of roadways and traffic conditions, along with potential impacts of the dairy farm construction and operation. Primary access to the site is via Māhā'ulepū Road, a two-way, two-lane road, which is accessible from Kōloa Road (Highway 530) via Ala Kinoiki Road. Within the project area, there is a network of unimproved private agriculture haul roads that provide access to and from Māhā'ulepū Road.

Roadways in the project area operate smoothly with no periods of heavy traffic. On average, traffic in the region is much lower than urban areas in the state due to the low population of Kaua'i and rural agricultural demographics of the south Kaua'i area and Māhā'ulepū. Traffic on Māhā'ulepū Road consists of agricultural vehicles, residential and resort visitor traffic.

During construction, the proposed project is not expected to have a significant short term impact on traffic operations in the project vicinity. Additional traffic will be

generated during construction, but will return to normal levels after project completion during day-to-day operations. There will be no change to traffic patterns or infrastructure related to the public roads.

Traffic operations along Māhā'ulepū Road and the surrounding County roads are expected to continue to operate at acceptable levels of service during peak hours of traffic. The projected increase in vehicle movements related to HDF operations for the committed herd size of 699 cows would include 5 daily employees accessing the site, milk tanker and supply trucks every two days, and truck with stock trailer, for a total of 12 additional vehicle trips per day. Daily traffic along Ala Kinoiki Road and Kōloa Road was 8,000 and 6,500 cars daily; HDF-related traffic would add less than one percent additional trips. These additional trips would have a minimal effect on traffic conditions at County roadways in the surrounding area.

At a contemplated herd size of up to 2,000 cows, an additional 11 vehicle trips per day would access the HDF site, for a total of 23 vehicle trips daily. Projections for daily vehicle movements in 2035 for Ala Kinoiki Road and Kōloa Road are 7,200 and 9,500 daily vehicles. HDF-related traffic would add less than one percent. These additional trips would have a minimal effect on traffic conditions at County roadways in the surrounding area. Traffic data is presented in the Draft EIS Sections 4.18 and 4.24.

Construction equipment mobilization will comply with Hawai'i Department of Transportation and County requirements. Delivery trucks and milk tanker trucks will be in compliance with State and County size and weight limits; no oversized vehicles will be used for ongoing operations.

AIR QUALITY: As a part of the Environmental Impact Statement (EIS), existing air quality conditions and project impacts were evaluated, including dust and odor. Potential odors and emission levels for air pollutants relevant to dairy operations were modeled, as currently there are no cows on site. EIS sections 4.19 and 4.25 provide an evaluation of air quality and odors, including a windrose depicting wind speed and direction in the area (see DEIS Section 4.1, Climate). The full air quality technical report can be found in Draft EIS Appendix I.

Clean Air Act

Under the *Clean Air Act of 1970* (CAA), amended November 1990, the U.S. Environmental Protection Agency (EPA) regulates both large and small sources of air pollutants by establishing National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. The State of Hawai'i has established its own *State Ambient Air Quality Standards* (SAAQS) that are as strict or, in some cases more strict than the NAAQS. State standards prohibit any visible emissions of fugitive dust from construction activities at the property line.

Emissions relevant to livestock operation include particulate matter and fugitive dust. Greenhouse gases related to dairy cows include methane (CH_4) from enteric fermentation, and both methane and nitrous oxide (N_20) emissions from manure

application. No State or Federal regulations for greenhouse gas emissions from farm operations or small businesses currently exist.

DUST

Dust will be generated as cows move along soft limestone walkways that connect the paddocks and lead to and from the milking parlor. Potential fugitive dust emission rates were estimated from published literature, where particulate matter (PM) is measurable from the "drylots" of confined dairy operations where animals walk over dirt and dried manure throughout the day.

Applying the emission rates from this available literature greatly overestimates potential emission resulting from HDF. Cows in the pastoral rotational-grazing system will be on pasture 22 hours each day and will spend two hours – in two separate milking cycles –moving to and from the barn for the 10- to 15-minute milking sessions.

Using atmospheric dispersion modeling system (AERMOD), the rates were scaled to the size of the non-pasture areas used by cows at HDF. Results were added to the background concentration of particulate matter (both PM_{10} and $PM_{2.5}$) measured on the island of Kaua'i, and the total concentration was compared to the State ambient air quality standards. Only the contemplated herd size of up to 2,000 mature dairy cows was modeled, as at the lower threshold of 699 cows, the potential fugitive dust impact would be negligible. The estimated concentration for PM_{10} is 2.01 $\mu g/m^3$, well below the State standard of 150 $\mu g/m^3$. The estimated concentration for $PM_{2.5}$ is 0.23 $\mu g/m^3$, well below the Federal standard of 35 $\mu g/m^3$ (see Draft EIS Section 4.19 and Table 4-19.2).

ODOR

Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF, so air dispersion models were used to determine potential odor levels. Local weather data was used in conjunction with the AERMOD modeling system, and published rates for manure odors emissions for dairy heifers and effluent ponds were adapted to reflect the HDF facilities.

Odor emission sources identified for modeling at HDF were manure in the pasture fields, irrigation water containing diluted nutrients from effluent, the effluent storage ponds, and the dairy buildings. Odor rates from published research were applied. Odor isopleths (a line used to map all points having the same numerical value) were created to display the model findings. Odor is described in "odor units" at the threshold of perception, which is defined by the point at which 50 percent of panelists, in laboratory conditions, cannot smell the odor but 50 percent of the panelists can detect the odor.

Modeling results were generated for worst case meteorological conditions (low wind velocity / mixing). Generally, tradewinds will disperse odors to less than detectable levels beyond the HDF site; in periods of no wind, odor may not be

dispersed creating the "worst case" scenario. In these periods without normal tradewind flow, the odor plume would extend to the south of the HDF site. Sections 4.19.2 and 4.25.2 of the EIS include graphics of the potential odor isopleths.

Results for the committed herd size of 699 mature dairy cows show that odors may be detectable by 50 percent of the sensitive population once per 200 hours, or 44 hours per year, within an area that extends approximately 1,670-feet (within one-third of a mile) beyond the dairy farm boundary, and does not reach recreational or residential areas. Results for the contemplated expanded herd size of up to 2,000 mature dairy cows show odors would not extend beyond 2,780 feet outside the HDF boundary (just over half a mile), again not reaching recreational or residential areas, and again with detection limited to 50 percent of the sensitive population approximately 44 hours per year. The parameters used in the analysis were intentionally conservative, and the impacts shown assume an unlikely confluence of worst-case meteorological data, irrigation location, and grazing location. Actual offsite odor impacts are likely to be much lower and/or less frequent than shown; it is likely odor detection beyond the HDF boundaries will be less frequent.

ALTERNATIVES: As a part of the DEIS, alternatives were evaluated that could attain the objectives of the action's purpose and need, and were compared with environmental benefits, costs, and risks of each reasonable alternative against those of the proposed dairy project. Further discussion of alternatives can be found in DEIS Section 6.

The DEIS evaluates alternatives that could attain the objectives of the action's purpose and need, and compares environmental benefits, costs, and risks of each reasonable alternative against those of the proposed action. Additionally, reasonable land use alternatives that emerged from public input during the project scoping phase are documented and briefly discussed. The alternatives that do not meet the project purpose are not advanced for analysis of environmental benefits, costs, and risks. The Environmental Impact Statement Rules, Hawai'i Administrative Rules Chapter 11-200 (HRS 11-200) requires a discussion of alternatives that could attain the objectives of the action, regardless of cost. There is no requirement for the alternatives analysis to consider every possible land use.

Four possible land uses that would not meet the project purpose are discussed. Rezoning the land for resort or residential development, or a potential conservation condemnation are two uses that were examined and eliminated from analysis. These options would not be reasonably viable given the existing private land tenure and existing zoning. Two additional alternatives were considered as reasonable land uses as they could be permitted within the existing State Land Use Agricultural District and County Agricultural Zoning District. These options include Agricultural Park with Processing Center, and development of an Agricultural Subdivision. The alternatives were examined and eliminated from further analysis, however, as they would not fulfill the project purpose.

The analysis, therefore, focuses on alternatives that meet the project purpose. Rigorous exploration and evaluation of the environmental impacts of the alternatives, including those that might enhance environmental quality or avoid,

reduce or minimize some or all of the adverse environmental effects, costs and risks. These alternatives include: (1) the development of a Conventional Feedlot Dairy (a non-pasture-based dairy) at the same location; (2) development of the Pasture-Based Dairy at an Alternative Location on Kaua'i; and (3) milk products processing by HDF. The alternative of "No Action" is also evaluated.

The alternatives analysis provides a comprehensive evaluation of the range of potential alternatives, including the two alternative development scenarios. Although the alternatives are potentially reasonable uses under existing zoning and neighboring uses, each fails to comprehensively fulfill the project requirements defined by the eight Project Objectives and the four established Evaluation Criteria (Chapter 2, Sections 2.3.3 and 2.3.4).

The essential differences as compared to the proposed action are highlighted in the following statements.

- Only one of the alternative actions (conventional feedlot alternative) would create a commercial scale dairy operation in Hawai'i, with the capability to produce 10 percent of the State's fresh milk demand thus reducing dependence on imported milk (Objective 1). This alternative, however, would not reduce reliance on costly imported fertilizer and feed (Objective 2); grow local, quality grass as a primary feedstock (Objective 3); and would not utilize 100 percent of manure on site as nutrients to grow forage for dairy cows (Criterion 4).
- None of the alternatives would secure a dairy location that meets the requirements for a pastoral, pasture-based grazing dairy: sufficient contiguous land area; available long-term land tenure; adequate potable water supply; suitable soil properties; gentle slope conditions; and accessibility (Criterion 1).
- One alternative (Agricultural Park) could potentially generate new long-term employment in the agricultural sector on Kaua'i in a wide range of positions including pasture agronomy/soils science, environmental resources management (Criterion 2).
- The Agricultural Park alternative could also develop sustainable food production utilizing Important Agricultural Lands, demonstrating the importance of long-term agricultural leases and capital investment for agricultural infrastructure, water systems and support facilities. (Criterion 3). However, after years of trying, it appears there was limited interest in such a venture.
- Finally, addressing the range of potential environmental impacts (natural, cultural, social and economic) (Objective 8) the two alternative development scenarios would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.

In contrast to the other options considered, the planned agricultural operation of Hawai'i Dairy Farms, was determined to be the most viable option and is the preferred alternative. Of all the alternatives considered, this is the only approach that achieves project objectives and meets each of the four Evaluation Criteria.

- Hawai'i Dairy Farms will create a commercial scale pasture-based dairy operation in Hawai'i, with the capability to provide more than 1,000,000 gallons of the fresh milk demand, reducing dependence on imported milk (Objective 1).
- The planned dairy location meets the requirements of minimum land area, soil properties, slope conditions, water supply, land tenure and availability, and accessibility (Criterion 1).
- The planned action will generate new long-term employment in the agricultural sector on Kaua'i, including pasture agronomy/soils science, veterinary and animal husbandry, environmental resources management, milk/milk processing, and dairy business management (Criterion 2).
- Sustainable food production utilizing Important Agricultural Lands (Criterion 3) will occur with the proposed action, demonstrating the importance of long term agricultural leases, and the ability to draw capital investment for agricultural infrastructure including water systems and support facilities (Criterion 3).
- Address the range of potential environmental impacts by utilizing 100 percent of manure as natural fertilizer to grow the majority of food for cows (Criterion 4). The alternatives evaluated would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.
- Creating an economically viable pasture rotational-grazing model maintains agriculture, retains open space, and provides buffer between highly utilized resort and residential development and sensitive natural or cultural resources (Objective 8).

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

RE: RESPONSE TO PROPOSED ENVIRONMENTAL IMPACT STUDY

RECEIVED

FEB 24 2015

GROUP 70 INTL

State of Hawaii

Department of Health

1250 Punchbowl Street

Honolulu, HI 96813

Group 70 International, Inc.

925 Bethel Street 5th Floor

Honolulu, HI 96813

Hawaii Dairy Farms, LLC

P O Box 1690

Koloa, HI 96756-1690

To Whom It May Concern

I reside at 1831 Poipu Road, in Koloa. My home is located approximately 1-1/2 miles from the proposed Dairy Farm. The Dairy Farm will negatively impact my property value and my ability to enjoy the beautiful area I chose to retire to. I am sure what I have to share is not new but I felt compelled to put my thoughts on paper and send them to all concerned.

I am writing to voice my objections to the planned use of 578 acres of pristine land in the Maha'ulepu Valley for a very dangerous, unproven experiment. This project would violate every established criteria used in determining if a significant impact would result from the land's intended use. The sheer contention that because the land is zoned agricultural does not automatically make it subject to being abused in the manner that Hawaii Dairy Farms intends.

The many newspaper articles have talked about the amounts of manure and urine, smells that this could create the potential for flies and the run off of contamination into streams and eventually the ocean. These arguments against the planned use of the property have been numerously presented and probably stated more eloquently then I can in this letter.

I wish to issue strong objection with a point that I feel is an absolute falsehood perpetrated on the public by Hawaii Dairy Farms: namely the Hawaii Dairy Farms justification for being. "Fresh milk for Kauai/Hawaii families". Not sure how this can happen since all potential milk will have to be shipped to Oahu with there being no pasteurization facilities on Kauai. Once this happens all raw milk loses its identity as to its original source thus making returning it back to Kauai somewhat problematic. In addition pasteurized milk definitely commands a significantly higher price from Asia making a return to Kauai even more questionable. Anyone who believes the Hawaii Dairy Farms statement as being a major intent for establishing a dairy on Kauai is a prime candidate to be sold resort property in the heart of the Great Dismal Swamp, which is what Maha'ulepu could be looked at within a short period of time should the dairy be approved.

The Island of Kauai has other abundant suitable agricultural acreage upon which to establish a dairy should one be needed so badly. I can only scratch my head in wonderment why this acreage in Mala'elepu Valley, which possesses such a diverse historical, cultural, spiritual and environmental significance could have been chosen for an untested theoretical experiment that has never been proven to be a success anywhere in the world.

In summation, the dairy has not even been built yet but it has already provided a negative impact in the community through Hawaii Dairy Farm's attempt to strong arm their desire down the throat of the people it sought to appeal to. A terrible start to a terrible idea. This dairy must not be allowed to be built in Maha'eleupu Valley.

Sincerely,

February 22, 2015

Robert P. DeMichiel

Robert P DeMichiel

May 26, 2016

Robert P. DeMichiel
1831 Poipu Road
Koloa, HI 96756

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Robert P. DeMichiel:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

DAIRY OPERATIONS: Hawai'i Dairy Farms (HDF) will establish and operate a sustainable, pastoral rotational-grazing dairy farm in Māhā'ulepū Valley on the island of Kaua'i to produce fresh, locally available nutritious milk for Hawai'i families. The rotational-grazing method utilizes 100 percent of the cows' manure as natural fertilizer to grow pasture grass as a primary source of nutrition for dairy cows. This cost-effective method will reduce reliance on imported fertilizer and feed. Pasture grass will comprise at least 70 percent of the animals' diet. As a part of the Draft Environmental Impact Statement (EIS), the proposed facilities and operations for the dairy farm are described in Chapter 3.

The Environmental Impact Statement (EIS) Preparation Notice (EISPN), published January 23, 2015, described the proposed pasture-based rotational grazing system as a "zero-discharge, grass-fed dairy". The term "zero-discharge" under the U.S.

Environmental Protection Agency related to concentrated feeding operations (CAFO) is a system designed to not discharge pollutants into waters of the United States. As noted previously, the HDF system is designed to utilize 100 percent of the cows' manure on-site. However, nutrients would be introduced to the HDF site with any use; the Draft EIS identifies the amount of nutrients anticipated from the proposed dairy operations that could pass through to ground and surface waters. Therefore, HDF elected to discontinue use of the term "zero discharge" as it was construed as no nutrients into the system.

The term "grass-fed" was used in the HDF EISPN. This term was used to identify HDF's intent to utilize a locally-produced feedstock – grass – for more than 70 percent of the dairy herds' diet. In January 2016, the U.S. Department of Agricultural (USDA) Marketing Survey created a narrow legal definition of "grass-fed". The USDA standard defines what animals can and cannot be fed. The Food Alliance, a project of several northwest colleges, believes that when consumers choose grass-fed products there is an expectation that these will come from animals raised on pasture on a forage-based diet. Due to the evolving definition of "grass-fed", the term in not used in this EIS.

The dairy facilities will occupy an area of approximately 10 acres on the western boundary of the site. The developed area "footprint" will be less than 2 percent of the total farm area. Four buildings will be constructed to serve different functions, supported by utilities and infrastructure. Additional building information can be found in Draft EIS Section 3.3.1.

Agricultural infrastructure and utilities required for the dairy operations will include storage tanks and silos, effluent storage ponds, livestock water systems, and drainage improvements. The irrigation system and distribution of livestock water are discussed in Draft EIS Section 3.5, Pasture Management.

The pastoral rotational-grazing dairy provides a local feedstock – grass – as the herd's primary food source. Reducing imported feed stabilizes costs and provides a food source closer to the natural diet of cows. Results of grass trials initially conducted at five sites across four Hawaiian Islands were instrumental in identifying appropriate varieties of grass, and suitable sites to support sufficient "dry matter" grass yields essential to a cow's diet. Additional project-specific trials at the Māhā'ulepū site on Kauai have been conducted for more than 18 months. The results have identified sufficient yield and nutrition to supply 70 percent of the cows' diet; improvements in grass productivity are anticipated to provide up to 85 percent of cows' diet.

The pasture-based model allows cows to move about freely, and to lie down and rest, which is part of the digestion cycle. The animals are managed in social groups known as "mobs", mimicking the natural social order of bovines. Cows spend 22 hours of each 24-hour period foraging on pasture or resting, outdoors in natural light and fresh air. The gently sloped paddocks, walkways and races minimize the energy expended by the mature dairy cows as they graze or are transferred to and from the various paddocks and the mature dairy facility; surfaces of the walkways and cow races are designed to provide a comfortable path under hoof. The

management practices and pasture model applied by HDF maximizes grass as the cows' primary nutrition source and minimizes stress to the animals. Cows tend to be healthier and live longer, productive lives with access to fresh air, high quality feed, and exercise while they forage.

The 470 acres of pasture will be divided into paddocks averaging 3 to 5 acres in size. Smaller paddocks located near the dairy facility will be used as temporary pasture for cows or calves being moved on or off the farm. To protect the water quality of surface water and downstream areas, paddock fences are set back 35 feet from the edge of drainage ways throughout the site. Existing vegetation within the setbacks will be managed or restored to reduce erosion, improve stability of ditch banks, increase net carbon storage, and improve and maintain water quality.

The majority of the pastures will be irrigated with non-potable water and/or diluted effluent through either the pivot irrigation systems or through gun irrigators. Irrigation water supply is provided to the farm from Waita Reservoir, and will be filtered and pumped to the various irrigation components on the farm. The irrigation system is controlled using computer software and GPS receivers to allow very precise application of irrigation and/or diluted effluent on the pasture. The pivots can rotate and apply irrigation water and/or diluted effluent at different rates depending on the actual irrigation needs of the farm.

NRCS provides technical guidance on applying agricultural waste depending on the desired use of the waste. Reflected in the title of the livestock waste guidance for Hawai'i is the parenthetical inclusion of the word "nutrients." Where waste is utilized as a resource, it is being used for the constituent components that provide benefit.

The NRCS Conservation Practice Standard 590, Nutrient Management, applies to commercial fertilizers, organic by-products, waste water, organic matter, and irrigation water. Nutrient management is the practice of managing the amount, rate, source, method of application, and timing of plant nutrients and soil amendments. The timing and application of nutrients will correspond with plant uptake, soil properties and weather conditions. For more information on nutrient balance management see Draft EIS Section 3.5.3, and Draft EIS Appendix D.

The effluent storage ponds are sized to accommodate 30 days of storage for up to 2,000 mature dairy cows, and over 85 days of storage for 699 mature dairy cows. It will be highly unlikely that the storage pond will be full at any time for the contemplated 2,000-cow dairy, and nearly impossible for the committed 699-cow dairy. Throughout the less than 30-day storage period, effluent is planned for application every four days, and the slurry application is expected at least once every 45 days, to ensure that the ponds are kept at manageable levels.

Cows lactate milk following the birth of calves. Newborn calves will be housed on the Māhā'ulepū site and provided essential colostrum and nutrients for a healthy start. During the calves' initial 90 days, they will be transitioned to pasture at HDF before transfer to ranches on Kaua'i to be raised off-site. The committed herd size of 699 mature dairy cows at the Māhā'ulepū site applies to mature mature dairy cows.

Animals in various stages of lactation and rest will be transferred between HDF and other partner ranches as needed for animal health and dairy productivity. This will benefit both the dairy and infuse the beef market in Hawai'i with a new, local source of pasture-raised calves. Male calves will become part of the beef cattle herd; heifers (young female calves that haven't given birth) will be raised until ready to return to the HDF herd as a birthing/mature dairy cow. For more information on off-site herd management, refer to Section 3.7 of the Draft EIS.

Health of the herd is of primary importance as the success of a dairy relies on cows effectively producing quality milk. All cows will be treated with a high standard of care. Dairy managers and caretakers will be trained and competent in handling animals to minimize stress and ensure the herds' welfare. A licensed veterinarian may prescribe use of antibiotics approved by the Food & Drug Administration (FDA) for treatment of illnesses. Adherence to guidelines that prohibit milk from cows undergoing antibiotic treatment will ensure no adulteration of milk. Routine laboratory tests of milk for traces of antibiotic residue will be conducted. HDF will not inject cows with bovine growth hormone, referred to as rBST or rBGH.

ARCHAEOLOGICAL AND CULTURAL: The Hawai'i Dairy Farms (HDF) project is subject to a historic preservation review by the State Department of Land and Natural Resources, State Historic Preservation Division (SHPD) under HRS Chapter 6E and Chapter 13-284. An Archaeological Inventory Survey (AIS) and a Cultural Impact Assessment (CIA) were conducted by Scientific Consultant Services (SCS) for the proposed project. EIS Sections 4.7 and 4.8 provide an evaluation of archaeology and cultural resources, with technical studies in Appendix G and H.

A total of sixteen historic properties were identified through a pedestrian survey of the project area and an extended survey area of 100 meters of the northern boundary. Six historic-era sites occur in the project area and 10 sites occur in the extended survey area. Only one of the sites is believed to be associated with pre-Contact and/or early historic times. State Site 50-30-10-2250, the agricultural heiau, and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area. The remaining sites consist of historic-era bridges, ditches, culverts, retaining walls, and a flume system dating from the 20th century and are affiliated with sugarcane cultivation.

That a majority of the documented sites are related to the historic-era is not surprising, given the massive landscape modifications that occurred during intensive sugarcane cultivation on the valley floor. Even historic era cultural materials associated with the many Land Commission Awards in the project area were non-existent, as explored through survey and subsurface exploration.

The sixteen historic properties have been assessed for significance by the archaeological consultant and the dairy project is anticipated to have no impact on these sites. No further archaeological work is recommended for the sites. Two of the sixteen sites are considered significant under multiple criteria, but occur outside the project area on lands owned by a different landowner. Both sites will not be adversely affected by the proposed dairy project. No site is related to burials, and no bonex were found. Such sites have been reported along coastal areas in sand dunes.

The cultural assessment examined the potential effect of the project on cultural resources, practices or beliefs, its potential to isolate cultural resources, practices or beliefs from their setting, and the potential of the project to introduce elements which may alter the setting in which cultural practices take place. Information received from the community indicates the Māhāʻulepū Ahupuaʻa, has been and is currently used for traditional cultural purposes. However, the dairy project area has not been included in these activities. It is clear that the gathered plants, trails, State Site 50-30-10-2250, the agricultural heiau, and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area.

The project will be fully enclosed by perimeter fencing along the boundary of the leased premises, which will ensure that project activities and any related impacts are contained within the project area. Based on the research and comments received from the community, it is reasonable to conclude that, pursuant to Act 50, the exercise of native Hawaiian rights or any ethnic group related to numerous traditional cultural practices will not be impacted by establishment of the dairy.

DEMOGRAPHIC AND ECONOMIC: The potential impacts of Hawai'i Dairy Farms (HDF) to the existing economy were evaluated in the Draft Environmental Impact Statement (EIS), including a fiscal impact assessment report completed in April, 2016 by Plasch Economics Pacific. Draft EIS Section 4.15 addresses demographic and economic factors, with the complete report in Appendix J.

The HDF project would create short-term benefits through jobs for local construction personnel and local material suppliers. Such jobs would include equipment operators, cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, supervisors, painters, etc. Based on State employment multipliers, indirect employment related to Dairy construction would be expected to average about 16 jobs on Kaua'i, and 8 on O'ahu. Construction employment would be expected to average about 12 jobs per year during the development period. Thus direct-plus-indirect employment association with construction would be expected to average approximately 36 jobs, of which 28 would be on Kaua'i.

The HDF project would contribute to diversification of Kaua'i's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Hawai'i Island), approximately10 percent of Hawai'i's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and indirect full-time equivalent jobs on Kaua'i, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on O'ahu.

HDF is expected to generate a net income of approximately $68,000 to the County when the 699 cow herd is established. When the dairy has matured to full production for the 699 cow dairy, net income to the State is calculated at $160,000 annually. With the potential contemplated herd size of up to 2,000 mature dairy

cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be produced. This would double local milk production currently supplied by operational dairies on the Island of Hawai'i.

Additional employment generated by a possible expansion to accommodate the contemplated 2,000 mature dairy cow herd is estimated at approximately 3 construction jobs plus 4 indirect jobs on Kaua'i, and 2 indirect jobs on O'ahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an additional 5 full-time farm jobs would be added, with approximately 15 additional indirect jobs on Kaua'i and another 8 indirect jobs on O'ahu.

The dairy is expected to generate a net additional contribution to the County of approximately $8,000 for improvements related to expansion for the contemplated herd size of up to 2,000 mature dairy cows ($76,000 total versus $68,000 for the committed herd size). The State will derive approximately $360,000 annually in revenues from the contemplated 2,000-mature dairy cow dairy.

Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhāʻulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic

material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhāʻulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Poʻipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhāʻulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawaiʻi Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhāʻulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhāʻulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhāʻulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and

groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kauaʻi community.

Regional Water Demand: The adjacent, developed Kōloa-Poʻipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kauaʻi will increase county-wide by 17,300 residents by 2030. The South Kauaʻi population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kauaʻi region (the Kōloa - Poʻipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhāʻulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhāʻulepū watershed.

The HDF site is located on the bottom-land of the upper Māhāʻulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Haʻupu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhāʻulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kauaʻi Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the

State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhāʻulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhāʻulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhāʻulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the

potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Poʻipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator

bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kaua'i community.

ALTERNATIVES: As a part of the DEIS, alternatives were evaluated that could attain the objectives of the action's purpose and need, and were compared with environmental benefits, costs, and risks of each reasonable alternative against those of the proposed dairy project. Further discussion of alternatives can be found in DEIS Section 6.

The DEIS evaluates alternatives that could attain the objectives of the action's purpose and need, and compares environmental benefits, costs, and risks of each reasonable alternative against those of the proposed action. Additionally, reasonable land use alternatives that emerged from public input during the project scoping phase are documented and briefly discussed. The alternatives that do not meet the project purpose are not advanced for analysis of environmental benefits, costs, and risks. The Environmental Impact Statement Rules, Hawai'i Administrative Rules Chapter 11-200 (HRS 11-200) requires a discussion of alternatives that could attain the objectives of the action, regardless of cost. There is no requirement for the alternatives analysis to consider every possible land use.

Four possible land uses that would not meet the project purpose are discussed. Rezoning the land for resort or residential development, or a potential conservation condemnation are two uses that were examined and eliminated from analysis. These options would not be reasonably viable given the existing private land tenure and existing zoning. Two additional alternatives were considered as reasonable land uses as they could be permitted within the existing State Land Use Agricultural District and County Agricultural Zoning District. These options include Agricultural Park with Processing Center, and development of an Agricultural Subdivision. The alternatives were examined and eliminated from further analysis, however, as they would not fulfill the project purpose.

The analysis, therefore, focuses on alternatives that meet the project purpose. Rigorous exploration and evaluation of the environmental impacts of the alternatives, including those that might enhance environmental quality or avoid, reduce or minimize some or all of the adverse environmental effects, costs and risks. These alternatives include: (1) the development of a Conventional Feedlot Dairy (a non-pasture-based dairy) at the same location; (2) development of the Pasture-Based Dairy at an Alternative Location on Kaua'i; and (3) milk products processing by HDF. The alternative of "No Action" is also evaluated.

The alternatives analysis provides a comprehensive evaluation of the range of potential alternatives, including the two alternative development scenarios. Although the alternatives are potentially reasonable uses under existing zoning and neighboring uses, each fails to comprehensively fulfill the project requirements defined by the eight Project Objectives and the four established Evaluation Criteria (Chapter 2, Sections 2.3.3 and 2.3.4).

The essential differences as compared to the proposed action are highlighted in the following statements.

- Only one of the alternative actions (conventional feedlot alternative) would create a commercial scale dairy operation in Hawai'i, with the capability to produce 10 percent of the State's fresh milk demand thus reducing dependence on imported milk (Objective 1). This alternative, however, would not reduce reliance on costly imported fertilizer and feed (Objective 2); grow local, quality grass as a primary feedstock (Objective 3); and would not utilize 100 percent of manure on site as nutrients to grow forage for dairy cows (Criterion 4).
- None of the alternatives would secure a dairy location that meets the requirements for a pastoral, pasture-based grazing dairy: sufficient contiguous land area; available long-term land tenure; adequate potable water supply; suitable soil properties; gentle slope conditions; and accessibility (Criterion 1).
- One alternative (Agricultural Park) could potentially generate new long-term employment in the agricultural sector on Kaua'i in a wide range of positions including pasture agronomy/soils science, environmental resources management (Criterion 2).
- The Agricultural Park alternative could also develop sustainable food production utilizing Important Agricultural Lands, demonstrating the importance of long-term agricultural leases and capital investment for agricultural infrastructure, water systems and support facilities. (Criterion 3). However, after years of trying, it appears there was limited interest in such a venture.
- Finally, addressing the range of potential environmental impacts (natural, cultural, social and economic) (Objective 8) the two alternative development scenarios would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.

In contrast to the other options considered, the planned agricultural operation of Hawai'i Dairy Farms, was determined to be the most viable option and is the preferred alternative. Of all the alternatives considered, this is the only approach that achieves project objectives and meets each of the four Evaluation Criteria.

- Hawai'i Dairy Farms will create a commercial scale pasture-based dairy operation in Hawai'i, with the capability to provide more than 1,000,000 gallons of the fresh milk demand, reducing dependence on imported milk (Objective 1).
- The planned dairy location meets the requirements of minimum land area,

soil properties, slope conditions, water supply, land tenure and availability, and accessibility (Criterion 1).

- The planned action will generate new long-term employment in the agricultural sector on Kaua'i, including pasture agronomy/soils science, veterinary and animal husbandry, environmental resources management, milk/milk processing, and dairy business management (Criterion 2).
- Sustainable food production utilizing Important Agricultural Lands (Criterion 3) will occur with the proposed action, demonstrating the importance of long term agricultural leases, and the ability to draw capital investment for agricultural infrastructure including water systems and support facilities (Criterion 3).
- Address the range of potential environmental impacts by utilizing 100 percent of manure as natural fertilizer to grow the majority of food for cows (Criterion 4). The alternatives evaluated would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.
- Creating an economically viable pasture rotational-grazing model maintains agriculture, retains open space, and provides buffer between highly utilized resort and residential development and sensitive natural or cultural resources (Objective 8).

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

RECEIVED
FEB 23 2015
GROUP 70 INTL

Hawaii Dairy Farm
Department of Health
Group 70

February 18, 2015

HDF, Department of Health, and Group 70

I think that locating a mega-dairy above the beautiful pristine area, Mahaulepu will be an irrevocable mistake! Here are my objections to HDF's plan that includes an eventual herd of 2,000 dairy cattle. This affects me, because I live on the South Shore, and I believe it will affect all of Kauai.

Because of the amount of waste and the unproven waste management system that HDF plans to use, I believe that the estimated 51 million Lbs of wet manure and 600,000 gallons of urine over a 6 months period, will be an uncontrollable amount, regardless of the effluent ponds, which other mega-dairy companies have found to leak. The runoff will eventually drain into streams that run into the ocean and will cause irrevocable damage to the fragile coral colonies that are currently struggling to survive there. Mahaulepu, and Poipu Beach, which are considered world class attractions and known for good swimming, will be ruined - lost forever.

The state of Hawaii is devising a policy that will mandate that all Kauai residents must convert to septic systems, in order to protect the waters that surround the island. Imagine the damage from run-off from 2,000 cows, should HDF's system fail. An estimated 51 million Lbs. of wet manure and an unthinkable 600,000 gallons of urine over a six months period, would find its way into our ecosystem. Also the National Tropical Botanical Garden, which is located on the South Shore and extends to the ocean, is home to thousands of rare plants in carefully controlled Microsystems, could be lost forever. Certainly there is some other place, possibly on a bigger Island, for an experimental mega-dairy.

Considering the economic wellbeing of the community, imagine the impact of biting flies and dairy stench on the visitor industry, which is the largest business enterprise in the South Side economy. No more dining on restaurant lanais, strolling to shops, sitting on hotel balconies, walking on the beach, watching the sunset, golfing at the Grand Hyatt. Visitor services of many kinds will no longer be able to make it.

So, It won't take long for the travel websites to "get wind" of "the big problem on Kauai". Tourism, upon which we rely will be a thing of the past. Just when we were getting a handle on unemployment, hundreds of visitor industry workers will be without work. This would be disastrous for a small island, and could result in more burglaries as people are unable to find work.

Housing values would be sure to drop. People's life savings down the drain - all because a billionaire is unwilling to look at relocating his business venture. Home values in other areas located near mega-dairies have suffered.

As stated at the EIS presentation on Feb. 19th 2015, HDF plans to leave a large portion of excrement on the ground to fertilize the feed grass. This would be on clay soil, and would it would eventually find its way to streams, the ocean, and also into near by wells. Two of these are the drinking water sources for the town of Koloa, and area of Lawai. HDF makes no mention of the proximity to the wells in their reports. This problem of contamination would certainly be heightened during a hurricane or even a big storm, such as Kauai residents refer to as "Forty Days and Forty Nights" that we experienced in the past. Even small storms could result in contamination.

Our wonderful world class environment is sure to be degraded by the addition of mega amounts of Methane gas, effluent run-off, and trampling cattle hooves. Also in need of consideration is the extremely rare Blind Cave Spider, one that has developed without eyes, and lives only in a cave on the Mahaulepu coast line. This extremely rare creature is currently being studied by scientists. Disturbing it's ecosystem and the special conditions that it needs to thrive, would result in a huge loss to all of Kauai. Fresh and costal waters that we have respected need to be kept in good condition and out of harm's way.

Our already over burdened roadways will surely be impacted by tanker trucks carrying milk for export from of Kauai. No plan to handle this in the HDF report. It seems that off island business owners are not really concerned with how their business impact our small island.

As per the above stated examples, an experimental mega-dairy is inappropriate for the Mahaulepu area. HDF seems insensitive to this fact, and to the realization that their business is not welcome at this location. The New Zealand Mega-Dairy Model is reportedly a huge failure. We don't need a mega-failure on Kauai.

Sincerely,

Diane deVries

Diane de Vries

GROUP 70 INTERNATIONAL

May 26, 2016

Diane deVries
3597 Kalaheo Road
Kalaheo, HI 96741

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Diane deVries:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

DAIRY OPERATIONS: Hawai'i Dairy Farms (HDF) will establish and operate a sustainable, pastoral rotational-grazing dairy farm in Māhā'ulepū Valley on the island of Kaua'i to produce fresh, locally available nutritious milk for Hawai'i families. The rotational-grazing method utilizes 100 percent of the cows' manure as natural fertilizer to grow pasture grass as a primary source of nutrition for dairy cows. This cost-effective method will reduce reliance on imported fertilizer and feed. Pasture grass will comprise at least 70 percent of the animals' diet. As a part of the Draft Environmental Impact Statement (EIS), the proposed facilities and operations for the dairy farm are described in Chapter 3.

The Environmental Impact Statement (EIS) Preparation Notice (EISPN), published January 23, 2015, described the proposed pasture-based rotational grazing system as a "zero-discharge, grass-fed dairy". The term "zero-discharge" under the U.S.

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Environmental Protection Agency related to concentrated feeding operations (CAFO) is a system designed to not discharge pollutants into waters of the United States. As noted previously, the HDF system is designed to utilize 100 percent of the cows' manure on-site. However, nutrients would be introduced to the HDF site with any use; the Draft EIS identifies the amount of nutrients anticipated from the proposed dairy operations that could pass through to ground and surface waters. Therefore, HDF elected to discontinue use of the term "zero discharge" as it was construed as no nutrients into the system.

The term "grass-fed" was used in the HDF EISPN. This term was used to identify HDF's intent to utilize a locally-produced feedstock – grass – for more than 70 percent of the dairy herds' diet. In January 2016, the U.S. Department of Agricultural (USDA) Marketing Survey created a narrow legal definition of "grass-fed". The USDA standard defines what animals can and cannot be fed. The Food Alliance, a project of several northwest colleges, believes that when consumers choose grass-fed products there is an expectation that these will come from animals raised on pasture on a forage-based diet. Due to the evolving definition of "grass-fed", the term in not used in this EIS.

The dairy facilities will occupy an area of approximately 10 acres on the western boundary of the site. The developed area "footprint" will be less than 2 percent of the total farm area. Four buildings will be constructed to serve different functions, supported by utilities and infrastructure. Additional building information can be found in Draft EIS Section 3.3.1.

Agricultural infrastructure and utilities required for the dairy operations will include storage tanks and silos, effluent storage ponds, livestock water systems, and drainage improvements. The irrigation system and distribution of livestock water are discussed in Draft EIS Section 3.5, Pasture Management.

The pastoral rotational-grazing dairy provides a local feedstock – grass – as the herd's primary food source. Reducing imported feed stabilizes costs and provides a food source closer to the natural diet of cows. Results of grass trials initially conducted at five sites across four Hawaiian Islands were instrumental in identifying appropriate varieties of grass, and suitable sites to support sufficient "dry matter" grass yields essential to a cow's diet. Additional project-specific trials at the Māhāʻulepū site on Kauai have been conducted for more than 18 months. The results have identified sufficient yield and nutrition to supply 70 percent of the cows' diet; improvements in grass productivity are anticipated to provide up to 85 percent of cows' diet.

The pasture-based model allows cows to move about freely, and to lie down and rest, which is part of the digestion cycle. The animals are managed in social groups known as "mobs", mimicking the natural social order of bovines. Cows spend 22 hours of each 24-hour period foraging on pasture or resting, outdoors in natural light and fresh air. The gently sloped paddocks, walkways and races minimize the energy expended by the mature dairy cows as they graze or are transferred to and from the various paddocks and the mature dairy facility; surfaces of the walkways and cow races are designed to provide a comfortable path under hoof. The

management practices and pasture model applied by HDF maximizes grass as the cows' primary nutrition source and minimizes stress to the animals. Cows tend to be healthier and live longer, productive lives with access to fresh air, high quality feed, and exercise while they forage.

The 470 acres of pasture will be divided into paddocks averaging 3 to 5 acres in size. Smaller paddocks located near the dairy facility will be used as temporary pasture for cows or calves being moved on or off the farm. To protect the water quality of surface water and downstream areas, paddock fences are set back 35 feet from the edge of drainage ways throughout the site. Existing vegetation within the setbacks will be managed or restored to reduce erosion, improve stability of ditch banks, increase net carbon storage, and improve and maintain water quality.

The majority of the pastures will be irrigated with non-potable water and/or diluted effluent through either the pivot irrigation systems or through gun irrigators. Irrigation water supply is provided to the farm from Waita Reservoir, and will be filtered and pumped to the various irrigation components on the farm. The irrigation system is controlled using computer software and GPS receivers to allow very precise application of irrigation and/or diluted effluent on the pasture. The pivots can rotate and apply irrigation water and/or diluted effluent at different rates depending on the actual irrigation needs of the farm.

NRCS provides technical guidance on applying agricultural waste depending on the desired use of the waste. Reflected in the title of the livestock waste guidance for Hawaiʻi is the parenthetical inclusion of the word "nutrients." Where waste is utilized as a resource, it is being used for the constituent components that provide benefit.

The NRCS Conservation Practice Standard 590, Nutrient Management, applies to commercial fertilizers, organic by-products, waste water, organic matter, and irrigation water. Nutrient management is the practice of managing the amount, rate, source, method of application, and timing of plant nutrients and soil amendments. The timing and application of nutrients will correspond with plant uptake, soil properties and weather conditions. For more information on nutrient balance management see Draft EIS Section 3.5.3, and Draft EIS Appendix D.

The effluent storage ponds are sized to accommodate 30 days of storage for up to 2,000 mature dairy cows, and over 85 days of storage for 699 mature dairy cows. It will be highly unlikely that the storage pond will be full at any time for the contemplated 2,000-cow dairy, and nearly impossible for the committed 699-cow dairy. Throughout the less than 30-day storage period, effluent is planned for application every four days, and the slurry application is expected at least once every 45 days, to ensure that the ponds are kept at manageable levels.

Cows lactate milk following the birth of calves. Newborn calves will be housed on the Māhāʻulepū site and provided essential colostrum and nutrients for a healthy start. During the calves' initial 90 days, they will be transitioned to pasture at HDF before transfer to ranches on Kauaʻi to be raised off-site. The committed herd size of 699 mature dairy cows at the Māhāʻulepū site applies to mature mature dairy cows.

Animals in various stages of lactation and rest will be transferred between HDF and other partner ranches as needed for animal health and dairy productivity. This will benefit both the dairy and infuse the beef market in Hawai'i with a new, local source of pasture-raised calves. Male calves will become part of the beef cattle herd; heifers (young female calves that haven't given birth) will be raised until ready to return to the HDF herd as a birthing/mature dairy cow. For more information on off-site herd management, refer to Section 3.7 of the Draft EIS.

Health of the herd is of primary importance as the success of a dairy relies on cows effectively producing quality milk. All cows will be treated with a high standard of care. Dairy managers and caretakers will be trained and competent in handling animals to minimize stress and ensure the herds' welfare. A licensed veterinarian may prescribe use of antibiotics approved by the Food & Drug Administration (FDA) for treatment of illnesses. Adherence to guidelines that prohibit milk from cows undergoing antibiotic treatment will ensure no adulteration of milk. Routine laboratory tests of milk for traces of antibiotic residue will be conducted. HDF will not inject cows with bovine growth hormone, referred to as rBST or rBGH.

NATURAL HAZARDS: The potential impacts of natural hazards are evaluated in the Draft Environmental Impact Statement (EIS), including flooding, tsunami, earthquakes, and hurricanes. Draft EIS Section 4.6 addresses natural hazards.

The Māhā'ulepū property is not known to experience flooding conditions. The area is located within Federal Emergency Management Agency (FEMA) Zone X, areas determined to be outside the 0.2% annual chance floodplain. The proposed location for Hawai'i Dairy Farms (HDF) lies between the 60 and 150 feet elevation, outside the tsunami evacuation zone. The Kaua'i and Ni'ihau region of the Hawaiian Islands has experienced tremors from earthquakes originating further south in the island chain, but no known seismic activity has originated among these northern islands.

Although they occur infrequently, Kaua'i has received a greater amount of damage from hurricanes when compared to the other Hawaiian Islands. Land management personnel in the Māhā'ulepū region during and following the hurricanes that affected Kaua'i in 1982 and 1992 observed defoliation of vegetation, and no flooding events in the period following passage of the storms.

Preparedness is the best protection for natural disasters. Structural design of dairy facilities will meet International Building Code (IBC) 2006 standards with local amendments. Provisions in design will address wind loading (including hurricane gusts), rain and flood loading, and earthquake loading. A geotechnical evaluation of the area recommended Seismic Site Class D under IBC standards be utilized for foundation design where the barns and agricultural infrastructure will be constructed.

There has been no rainfall event that would exceed the capacity of the effluent ponds since rainfall has been recorded in Māhā'ulepū Valley. The effluent pond capacity has been designed above the regulatory requirement to contain the 25-year, 24-hour rainfall event. An emergency containment berm with additional capacity for another 30 days is included in the design. This design exceeds

regulatory requirements, with containment in excess of the major rainfall events recorded on Kaua'i over the past three decades.

An emergency preparedness plan for protection of animals has been prepared for HDF internal use that addresses hurricane, fire, and potential flooding hazard scenarios. HDF is not in a tsunami inundation area, so this scenario is not planned for in the disaster plan. The disaster plan relies upon knowledge of cow behavior, and is based on extensive guidance for livestock protection from NRCS, the Florida State Agricultural Response Team (SART), Pennsylvania State College of Agricultural Sciences, and Cornell University Cooperative Extension. The plan includes safety procedures during any disaster, follow up actions, and emergency contacts for assistance before, during or following the event. Further information is provided in the Draft EIS Section 4.6.2.

FLORA AND FAUNA: Botanical, avian, and mammalian surveys of the property were conducted for the Draft Environmental Impact Statement (EIS) to assess existing species on site, including identifying any species listed as endangered, threatened, or proposed under any state or federal endangered species programs in or near the property. EIS Sections 4.9 and 4.10 address the evaluation of flora and fauna resources, with technical studies in Appendix A and B.

A botanical survey of the dairy property was conducted in August 2014 by AECOS Consulting to assess existing plant species. The survey also investigated for the presence of plants currently listed as endangered, threatened or proposed for listing under Federal or the State of Hawai'i's endangered species programs, located onsite or within the immediate vicinity of the dairy site. The nature of the land and its present and historical uses for intensive agriculture very much limit the natural botanical resources anticipated to occur on this land. Complete species lists are included in the EIS, and no protected botanical species occur on the project property. The project will include vegetated buffer strips along the drainage ways as part of the Conservation Plan to reduce erosion and stabilize slopes. Where native plants occur or could survive if planted, native plants will be used in the stabilization. No long-term impacts to native plant habitats or endangered or threatened plants species will occur as a result of the dairy.

Avian and mammalian surveys were conducted in August 2014 by Rana Biological Consulting, Inc. This survey was conducted to assess the potential presence of avian or mammalian species currently listed as endangered, threatened or proposed for listing under either Federal or the State endangered species lists. The survey covered the dairy site area and immediate vicinity. Common birds and terrestrial mammals were encountered on the property. There is no critical habitat for endangered species in the upper Māhā'ulepū Valley.

Four species of endangered waterbirds were recorded on the site and at the nearby taro farm located within the HDF site. Though the area does not provide critical habitat, seabirds that nest in upland areas of Kauai may overfly the site. The endangered Hawaiian goose, nēnē was also seen on the site. State Division of Forestry and Wildlife biologists have noted nēnē are regularly seen on the subject property. It is probable that some nest on or adjacent to the site as this species nests

in the general Kōloa area, and the habitat present on parts of the site is suitable for nēnē nesting.

The principal potential impacts posed to the five endangered species include those potentially associated with construction activities, and those associated with dairy farm operations following build-out. Measures will be adopted to avoid potential seabird and nēnē goose collisions with fences and structures. Potential measures include lowering construction cranes at night, using conservation fencing to project-specified areas, marking tall structures and fencing with white visibility polytape, limiting nighttime lighting, and shading any outside lights used at night. Ongoing mitigation strategies will be implemented for day-to-day preventative measures, including an Avian Species Protection Plan. Mitigation measures are further described in DEIS Section 4.10.2.

It is also likely that Hawaiian hoary bats overfly the project area on a seasonal basis. While caution will be taken during any potential disturbance or vegetation removal, there are almost no suitable roost trees within the dairy site, thus it is expected that the dairy farm will not affect this listed mammalian species.

INVERTEBRATE SPECIES: A study of invertebrate species and pest insects was conducted by Steven Lee Montgomery, PhD, Consulting Biologist. The study summarizes the presence or absence of native species or pest species associated with cattle manure in the general Māhāʻulepū area, as well as the parasites and predators on site that control those species. Fieldwork was conducted during September 15-16, 2014. The entire study is included in Draft Environmental Impact Statement (EIS) as Appendix B.

CAVE AND LAVA TUBE INVERTEBRATES

There are no known caves or lava tubes found at or adjacent to the dairy farm property. The Kōloa Lava Tube System, which provides habitat for two endemic cave species, the Kauaʻi Cave Wolf Spider and the Kauaʻi Cave amphipod, is located several miles away from the dairy farm property. Both invertebrates are listed as endangered under the U.S. Endangered Species Act. Not all caves in the Kōloa area contain these invertebrates, as many do not contain the optimal climatological conditions required by these organisms. Neither the botanical and faunal survey nor the invertebrate survey revealed any evidence of lava tubes or caves on the property, and no such features have been reported for the area near the Hawaiʻi Dairy Farms (HDF) site. Thus no cave invertebrate species will be affected by the dairy farm.

INTRODUCED PREDATOR INSECTS

An invertebrate study of manure-associated insects was conducted for the Draft EIS. The study included a field survey that used manure from an adjacent beef cattle herd as a lure, and determined flies and other manure-related insects currently present at the HDF site. Pest insects such as flies can negatively impact livestock health and production, and are therefore actively managed to prevent stress and loss of productivity at dairy operations.

At the HDF site, two common flies were identified: the stable fly and the horn fly. Both of these flies are widespread throughout the Hawaiian Islands. The greenbottle fly was reared from manure taken back to a laboratory following the field survey. Additionally, flies known to exist on Kauaʻi but not seen at the HDF site during the survey were identified and include the house fly, the dog dung fly, and the chicken dung fly. These pests are common in areas with high pet populations.

In response to cattle-related insect pests, numerous species known to compete with the pests were introduced to Hawaiʻi between 1898 and 1982. Twenty species of predators and competitors to the horn fly were successfully established during that period. Cattle egrets break up dung patties while searching for prey, and were introduced to Hawaiʻi in the late 1950s to control cattle-associated insects. Extensive introduction of dung beetle species resulted in 14 dung beetle species becoming established on Kauaʻi.

A healthy population of dung beetles can bury a dung pat in one to three days, which disrupts reproduction of flies such as the stable fly and horn fly. The stable fly requires approximately 21 days within the dung patty for the immature life stage (egg to pupa) to survive; the horn fly takes 10 to 20 days from egg to adult. Incorporation of the manure into the soil profile by dung beetles removes the habitat these flies require to complete their lifecycle. Research shows that 95 percent fewer horn flies emerged from dung patties containing a dung beetle species that has been identified at the HDF site. Proven control methods for the stable fly include parasitic micro-wasps and spreading out manure.

Among the invertebrates previously introduced to Hawaiʻi to combat livestock-related flies are extremely tiny parasitic wasps that prey on various fly species. The adult wasps could be described as the size of gnat. Using an ovipositor – described by lay people as a "stinger" – the female lays eggs in the larvae or pupa of flies. The male wasp has no such "stinger". See Draft EIS Section 4.11 for a photo providing scale for these tiny, non-stinging wasps.

To minimize potential establishment of pest flies or other insects, food waste generated during the construction phase will be bagged, covered, contained and disposed of in order to limit possible breeding habitat for flies. Inspections of building materials for ants or other insects will be conducted to prevent introduction of new pests to the HDF site. Short-term controls, including mechanical methods (e.g. sticky tapes or ribbons in the milking parlor, or traps with or without attractants) and chemical methods may be used to prevent short-term spikes in pest populations.

Insecticides and herbicides are non-discriminatory and kill beneficial as well as pest insects. Beneficial insects include primary decomposers such as earthworms and dung beetles, and pollinators including bees. Should chemical control be needed for short-term spikes in pest populations, application would be by those qualified, and in accordance with regulatory labeling requirements. HDF will implement long-term integrated pest management, which utilizes knowledge of the ancient food web among species by disrupting the manure habitat required to complete the fly life cycle. HDF and other ranchers on Kauaʻi may choose to engage with the State

Department of Agriculture to translocation dung beetle species already introduced on Kaua'i to Māhā'ulepū and other areas where manure-related flies may be a problem.

IMPACT OF SPRAYS ON BEES

Beneficial insects include primary decomposers such as earthworms and dung beetles, and pollinators including bees. Honey bees are an essential part of any agricultural ecosystem, and were observed on site during the invertebrate species survey. Pesticides and herbicides can reduce populations of beneficial insects, which is why HDF will utilize an integrated pest management approach.

It is expected that honey bees will visit water sources set up for the HDF herd. Preventative measures will be built into any open water source to prevent bees from being trapped, and HDF will contact local beekeepers for advice regarding any bees or bee colonies encountered on site. Safe application practices for any unavoidable herbicide or pesticide will be utilized in order to narrowly target the correct pest species without harming other insects and animals in the area. Anyone using herbicides or pesticides will be properly trained and informed, and if a honey bee colony location appears to be a danger to workers or cattle, or to be in danger itself, a local beekeeper will be contacted for advice and removal.

PESTS: A study of invertebrate species and pest insects was conducted by Steven Lee Montgomery, PhD, Consulting Biologist in January 2016. The study summarizes the presence or absence of native species or pest species associated with cattle manure in the general Māhā'ulepū area, as well as the parasites and predators that control those species. No federally or state listed endangered or threatened invertebrate species were noted in the survey of the site. A full report and list of species found on site is provided in EIS Section 4.11 and Appendix B.

Flies were identified on the HDF site using manure from neighboring livestock as bait for invertebrates. The two flies associated with livestock are the stable fly and the horn fly, the latter known for biting cattle. These flies and the greenbottle fly are often confused with the house fly. Flies known to exist on Kaua'i but not seen at the HDF site include the house fly, the dog dung fly, and the chicken dung fly. These pests are common in areas with high pet populations. It is possible these fly species could inadvertently be brought to the dairy and utilize manure as a food source. HDF will prevent and control fly population growth through diligent clean up and sanitation practices regarding any trash and food waste, as well as through efficient manure composting practices. A full list of site management measures is provided in EIS Section 4.11. The project location does not provide any habitat for *drosophila musaphilia*, the only Kaua'i species of native Hawaiian fly listed as Endangered or Threatened. Native Drosophila habitat is located many miles away in the high elevation koa-'ōhi'a forests.

Fly populations at HDF will be minimized through a process known as Integrated Pest Management (IPM). Essentially, IPM disrupts reproduction with appropriate means at key points in the pest's life cycle. Used in Hawai'i for decades, a number of invertebrates and a bird (the cattle egret) were introduced between 1898 and 1950

to reduce livestock-related insects. IPM utilizes knowledge of the ancient food web among species.

An especially important insect to minimize fly breeding habitat in manure is the dung beetle, which buries manure and incorporates it into the soil. Populations of dung beetles found on Kaua'i and those species already in Māhā'ulepū Valley, will increase with the increased manure food source, thus increasing and speeding breakdown of manure. Dung beetles are specialists in the very important natural process of breaking up and quickly recycling bovine manure pads. The behavioral diversity among dung beetle species will work together to bury dung pats in one to three days, a shorter amount of time than the 10-30 days flies eggs need to hatch.

In the Kōloa-Po'ipū region, pest fly populations are dependent upon food and breeding sources nearby such as dog, cat, and chicken feces. Beef cattle graze in the region on agricultural lands along Ala Kinoiki Road between Kōloa and Po'ipū, and it is likely the livestock-related flies identified at the HDF site occur in this region as well. Localized controls to reduce pest populations need to address breeding sites in and amongst the food and animals wastes within the area. These mitigation measures will make it difficult for flies to breed, and BMPs will be enforced to address any increase in population, therefore it is expected that the dairy farm will not significantly affect recreational and resort areas.

DEMOGRAPHIC AND ECONOMIC: The potential impacts of Hawai'i Dairy Farms (HDF) to the existing economy were evaluated in the Draft Environmental Impact Statement (EIS), including a fiscal impact assessment report completed in April, 2016 by Plasch Economics Pacific. Draft EIS Section 4.15 addresses demographic and economic factors, with the complete report in Appendix J.

The HDF project would create short-term benefits through jobs for local construction personnel and local material suppliers. Such jobs would include equipment operators, cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, supervisors, painters, etc. Based on State employment multipliers, indirect employment related to Dairy construction would be expected to average about 16 jobs on Kaua'i, and 8 on O'ahu. Construction employment would be expected to average about 12 jobs per year during the development period. Thus direct-plus-indirect employment association with construction would be expected to average approximately 36 jobs, of which 28 would be on Kaua'i.

The HDF project would contribute to diversification of Kaua'i's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Hawai'i Island), approximately10 percent of Hawai'i's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and indirect full-time equivalent jobs on Kaua'i, including 5 farm jobs and about 11

indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on O'ahu.

HDF is expected to generate a net income of approximately $68,000 to the County when the 699 cow herd is established. When the dairy has matured to full production for the 699 cow dairy, net income to the State is calculated at $160,000 annually. With the potential contemplated herd size of up to 2,000 mature dairy cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be produced. This would double local milk production currently supplied by operational dairies on the Island of Hawai'i.

Additional employment generated by a possible expansion to accommodate the contemplated 2,000 mature dairy cow herd is estimated at approximately 3 construction jobs plus 4 indirect jobs on Kaua'i, and 2 indirect jobs on O'ahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an additional 5 full-time farm jobs would be added, with approximately 15 additional indirect jobs on Kaua'i and another 8 indirect jobs on O'ahu.

The dairy is expected to generate a net additional contribution to the County of approximately $8,000 for improvements related to expansion for the contemplated herd size of up to 2,000 mature dairy cows ($76,000 total versus $68,000 for the committed herd size). The State will derive approximately $360,000 annually in revenues from the contemplated 2,000-mature dairy cow dairy.

Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhā'ulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa

series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhā'ulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Po'ipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhā'ulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawai'i Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhā'ulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhā'ulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhā'ulepū Valley, HDF

established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kaua'i community.

Regional Water Demand: The adjacent, developed Kōloa-Po'ipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kaua'i will increase county-wide by 17,300 residents by 2030. The South Kaua'i population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kaua'i region (the Kōloa - Po'ipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhā'ulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhā'ulepū watershed.

The HDF site is located on the bottom-land of the upper Māhā'ulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Ha'upu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhā'ulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and

prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kaua'i Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhā'ulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhā'ulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhā'ulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Poʻipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kauaʻi community.

TRAFFIC: The Draft Environmental Impact Statement (EIS) Section 4.18 and 4.25 includes an evaluation of roadways and traffic conditions, along with potential impacts of the dairy farm construction and operation. Primary access to the site is via Māhāʻulepū Road, a two-way, two-lane road, which is accessible from Kōloa Road (Highway 530) via Ala Kinoiki Road. Within the project area, there is a network of unimproved private agriculture haul roads that provide access to and from Māhāʻulepū Road.

Roadways in the project area operate smoothly with no periods of heavy traffic. On average, traffic in the region is much lower than urban areas in the state due to the low population of Kauaʻi and rural agricultural demographics of the south Kauaʻi area and Māhāʻulepū. Traffic on Māhāʻulepū Road consists of agricultural vehicles, residential and resort visitor traffic.

During construction, the proposed project is not expected to have a significant short term impact on traffic operations in the project vicinity. Additional traffic will be generated during construction, but will return to normal levels after project completion during day-to-day operations. There will be no change to traffic patterns or infrastructure related to the public roads.

Traffic operations along Māhāʻulepū Road and the surrounding County roads are expected to continue to operate at acceptable levels of service during peak hours of traffic. The projected increase in vehicle movements related to HDF operations for the committed herd size of 699 cows would include 5 daily employees accessing the site, milk tanker and supply trucks every two days, and truck with stock trailer, for a total of 12 additional vehicle trips per day. Daily traffic along Ala Kinoiki Road and Kōloa Road was 8,000 and 6,500 cars daily; HDF-related traffic would add less than

one percent additional trips. These additional trips would have a minimal effect on traffic conditions at County roadways in the surrounding area.

At a contemplated herd size of up to 2,000 cows, an additional 11 vehicle trips per day would access the HDF site, for a total of 23 vehicle trips daily. Projections for daily vehicle movements in 2035 for Ala Kinoiki Road and Kōloa Road are 7,200 and 9,500 daily vehicles. HDF-related traffic would add less than one percent. These additional trips would have a minimal effect on traffic conditions at County roadways in the surrounding area. Traffic data is presented in the Draft EIS Sections 4.18 and 4.24.

Construction equipment mobilization will comply with Hawai'i Department of Transportation and County requirements. Delivery trucks and milk tanker trucks will be in compliance with State and County size and weight limits; no oversized vehicles will be used for ongoing operations.

AIR QUALITY: As a part of the Environmental Impact Statement (EIS), existing air quality conditions and project impacts were evaluated, including dust and odor. Potential odors and emission levels for air pollutants relevant to dairy operations were modeled, as currently there are no cows on site. EIS sections 4.19 and 4.25 provide an evaluation of air quality and odors, including a windrose depicting wind speed and direction in the area (see DEIS Section 4.1, Climate). The full air quality technical report can be found in Draft EIS Appendix I.

Clean Air Act

Under the *Clean Air Act of 1970* (CAA), amended November 1990, the U.S. Environmental Protection Agency (EPA) regulates both large and small sources of air pollutants by establishing National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. The State of Hawai'i has established its own *State Ambient Air Quality Standards* (SAAQS) that are as strict or, in some cases more strict than the NAAQS. State standards prohibit any visible emissions of fugitive dust from construction activities at the property line.

Emissions relevant to livestock operation include particulate matter and fugitive dust. Greenhouse gases related to dairy cows include methane (CH_4) from enteric fermentation, and both methane and nitrous oxide (N_20) emissions from manure application. No State or Federal regulations for greenhouse gas emissions from farm operations or small businesses currently exist.

DUST

Dust will be generated as cows move along soft limestone walkways that connect the paddocks and lead to and from the milking parlor. Potential fugitive dust emission rates were estimated from published literature, where particulate matter (PM) is measurable from the "drylots" of confined dairy operations where animals walk over dirt and dried manure throughout the day.

Applying the emission rates from this available literature greatly overestimates potential emission resulting from HDF. Cows in the pastoral rotational-grazing

system will be on pasture 22 hours each day and will spend two hours – in two separate milking cycles –moving to and from the barn for the 10- to 15-minute milking sessions.

Using atmospheric dispersion modeling system (AERMOD), the rates were scaled to the size of the non-pasture areas used by cows at HDF. Results were added to the background concentration of particulate matter (both PM_{10} and $PM_{2.5}$) measured on the island of Kaua'i, and the total concentration was compared to the State ambient air quality standards. Only the contemplated herd size of up to 2,000 mature dairy cows was modeled, as at the lower threshold of 699 cows, the potential fugitive dust impact would be negligible. The estimated concentration for PM_{10} is 2.01 $\mu g/m^3$, well below the State standard of 150 $\mu g/m^3$. The estimated concentration for $PM_{2.5}$ is 0.23 $\mu g/m^3$, well below the Federal standard of 35 $\mu g/m^3$ (see Draft EIS Section 4.19 and Table 4-19.2).

ODOR

Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF, so air dispersion models were used to determine potential odor levels. Local weather data was used in conjunction with the AERMOD modeling system, and published rates for manure odors emissions for dairy heifers and effluent ponds were adapted to reflect the HDF facilities.

Odor emission sources identified for modeling at HDF were manure in the pasture fields, irrigation water containing diluted nutrients from effluent, the effluent storage ponds, and the dairy buildings. Odor rates from published research were applied. Odor isopleths (a line used to map all points having the same numerical value) were created to display the model findings. Odor is described in "odor units" at the threshold of perception, which is defined by the point at which 50 percent of panelists, in laboratory conditions, cannot smell the odor but 50 percent of the panelists can detect the odor.

Modeling results were generated for worst case meteorological conditions (low wind velocity / mixing). Generally, tradewinds will disperse odors to less than detectable levels beyond the HDF site; in periods of no wind, odor may not be dispersed creating the "worst case" scenario. In these periods without normal tradewind flow, the odor plume would extend to the south of the HDF site. Sections 4.19.2 and 4.25.2 of the EIS include graphics of the potential odor isopleths.

Results for the committed herd size of 699 mature dairy cows show that odors may be detectable by 50 percent of the sensitive population once per 200 hours, or 44 hours per year, within an area that extends approximately 1,670-feet (within one-third of a mile) beyond the dairy farm boundary, and does not reach recreational or residential areas. Results for the contemplated expanded herd size of up to 2,000 mature dairy cows show odors would not extend beyond 2,780 feet outside the HDF boundary (just over half a mile), again not reaching recreational or residential areas, and again with detection limited to 50 percent of the sensitive population approximately 44 hours per year. The parameters used in the analysis were

intentionally conservative, and the impacts shown assume an unlikely confluence of worst-case meteorological data, irrigation location, and grazing location. Actual offsite odor impacts are likely to be much lower and/or less frequent than shown; it is likely odor detection beyond the HDF boundaries will be less frequent.

ALTERNATIVES: As a part of the DEIS, alternatives were evaluated that could attain the objectives of the action's purpose and need, and were compared with environmental benefits, costs, and risks of each reasonable alternative against those of the proposed dairy project. Further discussion of alternatives can be found in DEIS Section 6.

The DEIS evaluates alternatives that could attain the objectives of the action's purpose and need, and compares environmental benefits, costs, and risks of each reasonable alternative against those of the proposed action. Additionally, reasonable land use alternatives that emerged from public input during the project scoping phase are documented and briefly discussed. The alternatives that do not meet the project purpose are not advanced for analysis of environmental benefits, costs, and risks. The Environmental Impact Statement Rules, Hawai'i Administrative Rules Chapter 11-200 (HRS 11-200) requires a discussion of alternatives that could attain the objectives of the action, regardless of cost. There is no requirement for the alternatives analysis to consider every possible land use.

Four possible land uses that would not meet the project purpose are discussed. Rezoning the land for resort or residential development, or a potential conservation condemnation are two uses that were examined and eliminated from analysis. These options would not be reasonably viable given the existing private land tenure and existing zoning. Two additional alternatives were considered as reasonable land uses as they could be permitted within the existing State Land Use Agricultural District and County Agricultural Zoning District. These options include Agricultural Park with Processing Center, and development of an Agricultural Subdivision. The alternatives were examined and eliminated from further analysis, however, as they would not fulfill the project purpose.

The analysis, therefore, focuses on alternatives that meet the project purpose. Rigorous exploration and evaluation of the environmental impacts of the alternatives, including those that might enhance environmental quality or avoid, reduce or minimize some or all of the adverse environmental effects, costs and risks. These alternatives include: (1) the development of a Conventional Feedlot Dairy (a non-pasture-based dairy) at the same location; (2) development of the Pasture-Based Dairy at an Alternative Location on Kaua'i; and (3) milk products processing by HDF. The alternative of "No Action" is also evaluated.

The alternatives analysis provides a comprehensive evaluation of the range of potential alternatives, including the two alternative development scenarios. Although the alternatives are potentially reasonable uses under existing zoning and neighboring uses, each fails to comprehensively fulfill the project requirements defined by the eight Project Objectives and the four established Evaluation Criteria (Chapter 2, Sections 2.3.3 and 2.3.4).

The essential differences as compared to the proposed action are highlighted in the following statements.

- Only one of the alternative actions (conventional feedlot alternative) would create a commercial scale dairy operation in Hawai'i, with the capability to produce 10 percent of the State's fresh milk demand thus reducing dependence on imported milk (Objective 1). This alternative, however, would not reduce reliance on costly imported fertilizer and feed (Objective 2); grow local, quality grass as a primary feedstock (Objective 3); and would not utilize 100 percent of manure on site as nutrients to grow forage for dairy cows (Criterion 4).
- None of the alternatives would secure a dairy location that meets the requirements for a pastoral, pasture-based grazing dairy: sufficient contiguous land area; available long-term land tenure; adequate potable water supply; suitable soil properties; gentle slope conditions; and accessibility (Criterion 1).
- One alternative (Agricultural Park) could potentially generate new long-term employment in the agricultural sector on Kaua'i in a wide range of positions including pasture agronomy/soils science, environmental resources management (Criterion 2).
- The Agricultural Park alternative could also develop sustainable food production utilizing Important Agricultural Lands, demonstrating the importance of long-term agricultural leases and capital investment for agricultural infrastructure, water systems and support facilities. (Criterion 3). However, after years of trying, it appears there was limited interest in such a venture.
- Finally, addressing the range of potential environmental impacts (natural, cultural, social and economic) (Objective 8) the two alternative development scenarios would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.

In contrast to the other options considered, the planned agricultural operation of Hawai'i Dairy Farms, was determined to be the most viable option and is the preferred alternative. Of all the alternatives considered, this is the only approach that achieves project objectives and meets each of the four Evaluation Criteria.

- Hawai'i Dairy Farms will create a commercial scale pasture-based dairy operation in Hawai'i, with the capability to provide more than 1,000,000 gallons of the fresh milk demand, reducing dependence on imported milk (Objective 1).
- The planned dairy location meets the requirements of minimum land area, soil properties, slope conditions, water supply, land tenure and availability, and accessibility (Criterion 1).
- The planned action will generate new long-term employment in the agricultural sector on Kaua'i, including pasture agronomy/soils science, veterinary and animal husbandry, environmental resources management, milk/milk processing, and dairy business management (Criterion 2).

- Sustainable food production utilizing Important Agricultural Lands (Criterion 3) will occur with the proposed action, demonstrating the importance of long term agricultural leases, and the ability to draw capital investment for agricultural infrastructure including water systems and support facilities (Criterion 3).
- Address the range of potential environmental impacts by utilizing 100 percent of manure as natural fertilizer to grow the majority of food for cows (Criterion 4). The alternatives evaluated would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.
- Creating an economically viable pasture rotational-grazing model maintains agriculture, retains open space, and provides buffer between highly utilized resort and residential development and sensitive natural or cultural resources (Objective 8).

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

RECEIVED
FEB 23 2015
GROUP 70 INTL

State of Hawaii, Dept. of Health
Environmental Planning Office
ATTN: Laura McIntyre
919 Ala Moana Blvd., Rm. 312
Honolulu, HI 96814

RE: Hawaii Dairy Farm EIS for Maha'ulepu Valley, Kauai

Aloha Ms. McIntyre,

I, David DeZerega, am a home owner and rental property owner in Koloa, HI. I am writing to comment on the scope of the EIS by "Group 70 International, Inc." for "Hawaii Dairy Farm's" proposal to ultimately have a 2,000 cow dairy on 578 acres in Maha'ulepu valley, Kauai, Hawaii.

My first concern is why is the trigger for the EIS voluntary, when the EIS presentation states the dairy is a "LARGE CONCENTRATED ANIMAL FEEDING OPERATION". My understanding is that a CAFO is required by law to trigger an EIS. Should not the EIS be statutorily triggered?

I am concerned about the alternatives being prescribed prior to the EIS process rather than developed in the process. Possible alternatives could be a smaller herd size on the allotted land, an alternative site or whatever the EIS process produces. We should not be limited to the THREE ALTERNATIVES described in the presentation.

The presentation says that excessive waste will will be shipped offsite. I worry that if there is excessive waste that it not effect the well water nor the coastal reef. Safeguards should be put into place and provided by HDF if approved. In addition a remediation process should be prescribed.

I worry about the influx of flies caused by the on site utilization of the fecal and urinary waste of the cows. Flies have a 2-5 mile radius from the site and that would affect my homes is Koloa. In addition to this pollution I am concerned with the methane pollution and hope that will be addressed.

Maha'ulepu is one of the most pristine and beautiful places on earth and I would not like to see it degraded.

Mahalo
David DeZerega
3018 Laua'e Place
Koloa, HI 96756

email: dezerega@hawaiiantel.net

cc: Group 70 International, Inc.
ATTN: Jeff Overton, HDF Project
925 Bethel St., 5th Flr.
Honolulu, HI 96813

Hawaii Dairy Farm
P.O. Box1690
Koloa HI ,96756

May 26, 2016

David DeZerega
3018 Laua'e Place
Koloa, HI 96756
dezerega@hawaiiantel.net

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear David DeZerega:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

GROUP 70 OBJECTIVITY: Group 70 International, Inc. (Group 70) is responsible for the preparation and processing of the Hawai'i Dairy Farms Environmental Impact Statement (EIS). The EIS was prepared in accordance with the requirements of Chapter 343 Hawai'i Revised Statutes and the "Environmental Impact Statement Rules" (Chapter 200 of Title 11, Hawai'i Administrative Rules). The environmental planning team at Group 70 has prepared several hundred Environmental Assessment and EIS documents over the past 40 years, and every document has been accepted by the responsible County, State and Federal agency. On numerous past EIS projects, the Hawai'i Chapter of the American Planning Association has recognized Group 70's professional work with Chapter awards for excellence in environmental planning. Part of the EIS scoping process involves Group 70's

experienced team of technical sub consultants that are well-known and qualified in their respective fields of study. For this project, Group 70 is preparing the Hawai'i Dairy Farms EIS with the level of analysis required to properly evaluate and disclose the existing environmental conditions, probable impacts with mitigation, and potential cumulative and secondary effects.

DAIRY OPERATIONS: Hawai'i Dairy Farms (HDF) will establish and operate a sustainable, pastoral rotational-grazing dairy farm in Māhā'ulepū Valley on the island of Kaua'i to produce fresh, locally available nutritious milk for Hawai'i families. The rotational-grazing method utilizes 100 percent of the cows' manure as natural fertilizer to grow pasture grass as a primary source of nutrition for dairy cows. This cost-effective method will reduce reliance on imported fertilizer and feed. Pasture grass will comprise at least 70 percent of the animals' diet. As a part of the Draft Environmental Impact Statement (EIS), the proposed facilities and operations for the dairy farm are described in Chapter 3.

The Environmental Impact Statement (EIS) Preparation Notice (EISPN), published January 23, 2015, described the proposed pasture-based rotational grazing system as a "zero-discharge, grass-fed dairy". The term "zero-discharge" under the U.S. Environmental Protection Agency related to concentrated feeding operations (CAFO) is a system designed to not discharge pollutants into waters of the United States. As noted previously, the HDF system is designed to utilize 100 percent of the cows' manure on-site. However, nutrients would be introduced to the HDF site with any use; the Draft EIS identifies the amount of nutrients anticipated from the proposed dairy operations that could pass through to ground and surface waters. Therefore, HDF elected to discontinue use of the term "zero discharge" as it was construed as no nutrients into the system.

The term "grass-fed" was used in the HDF EISPN. This term was used to identify HDF's intent to utilize a locally-produced feedstock – grass – for more than 70 percent of the dairy herds' diet. In January 2016, the U.S. Department of Agricultural (USDA) Marketing Survey created a narrow legal definition of "grass-fed". The USDA standard defines what animals can and cannot be fed. The Food Alliance, a project of several northwest colleges, believes that when consumers choose grass-fed products there is an expectation that these will come from animals raised on pasture on a forage-based diet. Due to the evolving definition of "grass-fed", the term in not used in this EIS.

The dairy facilities will occupy an area of approximately 10 acres on the western boundary of the site. The developed area "footprint" will be less than 2 percent of the total farm area. Four buildings will be constructed to serve different functions, supported by utilities and infrastructure. Additional building information can be found in Draft EIS Section 3.3.1.

Agricultural infrastructure and utilities required for the dairy operations will include storage tanks and silos, effluent storage ponds, livestock water systems, and drainage improvements. The irrigation system and distribution of livestock water are discussed in Draft EIS Section 3.5, Pasture Management.

The pastoral rotational-grazing dairy provides a local feedstock – grass – as the herd's primary food source. Reducing imported feed stabilizes costs and provides a food source closer to the natural diet of cows. Results of grass trials initially conducted at five sites across four Hawaiian Islands were instrumental in identifying appropriate varieties of grass, and suitable sites to support sufficient "dry matter" grass yields essential to a cow's diet. Additional project-specific trials at the Māhāʻulepū site on Kauai have been conducted for more than 18 months. The results have identified sufficient yield and nutrition to supply 70 percent of the cows' diet; improvements in grass productivity are anticipated to provide up to 85 percent of cows' diet.

The pasture-based model allows cows to move about freely, and to lie down and rest, which is part of the digestion cycle. The animals are managed in social groups known as "mobs", mimicking the natural social order of bovines. Cows spend 22 hours of each 24-hour period foraging on pasture or resting, outdoors in natural light and fresh air. The gently sloped paddocks, walkways and races minimize the energy expended by the mature dairy cows as they graze or are transferred to and from the various paddocks and the mature dairy facility; surfaces of the walkways and cow races are designed to provide a comfortable path under hoof. The management practices and pasture model applied by HDF maximizes grass as the cows' primary nutrition source and minimizes stress to the animals. Cows tend to be healthier and live longer, productive lives with access to fresh air, high quality feed, and exercise while they forage.

The 470 acres of pasture will be divided into paddocks averaging 3 to 5 acres in size. Smaller paddocks located near the dairy facility will be used as temporary pasture for cows or calves being moved on or off the farm. To protect the water quality of surface water and downstream areas, paddock fences are set back 35 feet from the edge of drainage ways throughout the site. Existing vegetation within the setbacks will be managed or restored to reduce erosion, improve stability of ditch banks, increase net carbon storage, and improve and maintain water quality.

The majority of the pastures will be irrigated with non-potable water and/or diluted effluent through either the pivot irrigation systems or through gun irrigators. Irrigation water supply is provided to the farm from Waita Reservoir, and will be filtered and pumped to the various irrigation components on the farm. The irrigation system is controlled using computer software and GPS receivers to allow very precise application of irrigation and/or diluted effluent on the pasture. The pivots can rotate and apply irrigation water and/or diluted effluent at different rates depending on the actual irrigation needs of the farm.

NRCS provides technical guidance on applying agricultural waste depending on the desired use of the waste. Reflected in the title of the livestock waste guidance for Hawaiʻi is the parenthetical inclusion of the word "nutrients." Where waste is utilized as a resource, it is being used for the constituent components that provide benefit.

The NRCS Conservation Practice Standard 590, Nutrient Management, applies to commercial fertilizers, organic by-products, waste water, organic matter, and

irrigation water. Nutrient management is the practice of managing the amount, rate, source, method of application, and timing of plant nutrients and soil amendments. The timing and application of nutrients will correspond with plant uptake, soil properties and weather conditions. For more information on nutrient balance management see Draft EIS Section 3.5.3, and Draft EIS Appendix D.

The effluent storage ponds are sized to accommodate 30 days of storage for up to 2,000 mature dairy cows, and over 85 days of storage for 699 mature dairy cows. It will be highly unlikely that the storage pond will be full at any time for the contemplated 2,000-cow dairy, and nearly impossible for the committed 699-cow dairy. Throughout the less than 30-day storage period, effluent is planned for application every four days, and the slurry application is expected at least once every 45 days, to ensure that the ponds are kept at manageable levels.

Cows lactate milk following the birth of calves. Newborn calves will be housed on the Māhāʻulepū site and provided essential colostrum and nutrients for a healthy start. During the calves' initial 90 days, they will be transitioned to pasture at HDF before transfer to ranches on Kauaʻi to be raised off-site. The committed herd size of 699 mature dairy cows at the Māhāʻulepū site applies to mature mature dairy cows. Animals in various stages of lactation and rest will be transferred between HDF and other partner ranches as needed for animal health and dairy productivity. This will benefit both the dairy and infuse the beef market in Hawaiʻi with a new, local source of pasture-raised calves. Male calves will become part of the beef cattle herd; heifers (young female calves that haven't given birth) will be raised until ready to return to the HDF herd as a birthing/mature dairy cow. For more information on off-site herd management, refer to Section 3.7 of the Draft EIS.

Health of the herd is of primary importance as the success of a dairy relies on cows effectively producing quality milk. All cows will be treated with a high standard of care. Dairy managers and caretakers will be trained and competent in handling animals to minimize stress and ensure the herds' welfare. A licensed veterinarian may prescribe use of antibiotics approved by the Food & Drug Administration (FDA) for treatment of illnesses. Adherence to guidelines that prohibit milk from cows undergoing antibiotic treatment will ensure no adulteration of milk. Routine laboratory tests of milk for traces of antibiotic residue will be conducted. HDF will not inject cows with bovine growth hormone, referred to as rBST or rBGH.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawaiʻi Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali

formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhāʻulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhāʻulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Poʻipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhāʻulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawaiʻi Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhāʻulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhāʻulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of

groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhāʻulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kauaʻi community.

Regional Water Demand: The adjacent, developed Kōloa-Poʻipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kauaʻi will increase county-wide by 17,300 residents by 2030. The South Kauaʻi population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kauaʻi region (the Kōloa - Poʻipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhāʻulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhāʻulepū watershed.

The HDF site is located on the bottom-land of the upper Māhāʻulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Haʻupu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhāʻulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built

facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kaua'i Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhā'ulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhā'ulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhā'ulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to

create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhā'ulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Po'ipū region were also calculated. Nitrogen input to the marine environment in the Po'ipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Po'ipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the

Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kaua'i community.

AIR QUALITY: As a part of the Environmental Impact Statement (EIS), existing air quality conditions and project impacts were evaluated, including dust and odor. Potential odors and emission levels for air pollutants relevant to dairy operations were modeled, as currently there are no cows on site. EIS sections 4.19 and 4.25 provide an evaluation of air quality and odors, including a windrose depicting wind speed and direction in the area (see DEIS Section 4.1, Climate). The full air quality technical report can be found in Draft EIS Appendix I.

Clean Air Act

Under the *Clean Air Act of 1970* (CAA), amended November 1990, the U.S. Environmental Protection Agency (EPA) regulates both large and small sources of air pollutants by establishing National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. The State of Hawai'i has established its own *State Ambient Air Quality Standards* (SAAQS) that are as strict or, in some cases more strict than the NAAQS. State standards prohibit any visible emissions of fugitive dust from construction activities at the property line.

Emissions relevant to livestock operation include particulate matter and fugitive dust. Greenhouse gases related to dairy cows include methane (CH_4) from enteric fermentation, and both methane and nitrous oxide (N_20) emissions from manure application. No State or Federal regulations for greenhouse gas emissions from farm operations or small businesses currently exist.

DUST

Dust will be generated as cows move along soft limestone walkways that connect the paddocks and lead to and from the milking parlor. Potential fugitive dust emission rates were estimated from published literature, where particulate matter (PM) is measurable from the "drylots" of confined dairy operations where animals walk over dirt and dried manure throughout the day.

Applying the emission rates from this available literature greatly overestimates potential emission resulting from HDF. Cows in the pastoral rotational-grazing system will be on pasture 22 hours each day and will spend two hours – in two separate milking cycles –moving to and from the barn for the 10- to 15-minute milking sessions.

Using atmospheric dispersion modeling system (AERMOD), the rates were scaled to the size of the non-pasture areas used by cows at HDF. Results were added to the background concentration of particulate matter (both PM_{10} and $PM_{2.5}$) measured on the island of Kaua'i, and the total concentration was compared to the State ambient air quality standards. Only the contemplated herd size of up to 2,000 mature dairy cows was modeled, as at the lower threshold of 699 cows, the potential fugitive dust impact would be negligible. The estimated concentration for PM_{10} is 2.01 $\mu g/m^3$, well below the State standard of 150 $\mu g/m^3$. The estimated concentration for $PM_{2.5}$ is 0.23 $\mu g/m^3$, well below the Federal standard of 35 $\mu g/m^3$ (see Draft EIS Section 4.19 and Table 4-19.2).

ODOR

Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF, so air dispersion models were used to determine potential odor levels. Local weather data was used in conjunction with the AERMOD modeling system, and published rates for manure odors emissions for dairy heifers and effluent ponds were adapted to reflect the HDF facilities.

Odor emission sources identified for modeling at HDF were manure in the pasture fields, irrigation water containing diluted nutrients from effluent, the effluent storage ponds, and the dairy buildings. Odor rates from published research were applied. Odor isopleths (a line used to map all points having the same numerical value) were created to display the model findings. Odor is described in "odor units" at the threshold of perception, which is defined by the point at which 50 percent of panelists, in laboratory conditions, cannot smell the odor but 50 percent of the panelists can detect the odor.

Modeling results were generated for worst case meteorological conditions (low wind velocity / mixing). Generally, tradewinds will disperse odors to less than detectable levels beyond the HDF site; in periods of no wind, odor may not be dispersed creating the "worst case" scenario. In these periods without normal tradewind flow, the odor plume would extend to the south of the HDF site. Sections 4.19.2 and 4.25.2 of the EIS include graphics of the potential odor isopleths.

Results for the committed herd size of 699 mature dairy cows show that odors may be detectable by 50 percent of the sensitive population once per 200 hours, or 44 hours per year, within an area that extends approximately 1,670-feet (within one-third of a mile) beyond the dairy farm boundary, and does not reach recreational or residential areas. Results for the contemplated expanded herd size of up to 2,000 mature dairy cows show odors would not extend beyond 2,780 feet outside the HDF boundary (just over half a mile), again not reaching recreational or residential areas, and again with detection limited to 50 percent of the sensitive population approximately 44 hours per year. The parameters used in the analysis were intentionally conservative, and the impacts shown assume an unlikely confluence of worst-case meteorological data, irrigation location, and grazing location. Actual offsite odor impacts are likely to be much lower and/or less frequent than shown; it is likely odor detection beyond the HDF boundaries will be less frequent.

GREENHOUSE GASSES: Draft Environmental Impact Statement (EIS) Sections 4.19 and 4.26 address the potential for greenhouse gas emissions by Hawai'i Dairy Farms (HDF). Estimates of GHG emission rates from a pasture-based dairy, including methane and nitrous oxide, were calculated using the 2006 Intergovernmental Panel on Climate Change (IPCC) Guidelines for National Greenhouse Gas Inventories. Parameters for Oceanic dairy cattle in warm climates were selected as most applicable to conditions at HDF. Long-term operational impacts were modeled using the IPCC guidelines and conversions, and estimated the emissions potential for GHG at the dairy at the committed herd size of 699 milking cows to be 2,693 CO_2e metric tons per year. This equates to roughly 1.02 percent of the utility power generation sector on Kaua'i in 2013, which does not include vehicle emissions and other GHG emitters on the island.

Potential GHG emissions for HDF at the contemplated herd size of up to 2,000 milking cows was modeled as described in Section 4.19.3 using the IPCC guidelines and conversions. The estimated total of 7,702 CO_2e metric tons per year (8,490 tons) is 5,009 CO_2e metric tons (5,521 tons) greater than the committed herd size of 699 milking cows. This equates to an increase equivalent to 1.91 percent of GHG produced on Kaua'i for power generation by the utility in 2013 (KIUC, 2014). Power generation does not include vehicle emissions and other GHG emitters on the island.

While the presence of cows may increase GHG, a long-term beneficial impact of the grazing fields is the sequestration of carbon as CO_2 captured by the process of photosynthesis by the grass. According to recent studies in the Soil Science Society of America Journal, converting formerly tilled cropland to grazed pasture can drive substantial accumulation of organic carbons in soil, which enhances soil quality, grass production, and has the potential to offset up to one-third the annual increase in CO_2 production of an area.

ALTERNATIVES: As a part of the DEIS, alternatives were evaluated that could attain the objectives of the action's purpose and need, and were compared with environmental benefits, costs, and risks of each reasonable alternative against those of the proposed dairy project. Further discussion of alternatives can be found in DEIS Section 6.

The DEIS evaluates alternatives that could attain the objectives of the action's purpose and need, and compares environmental benefits, costs, and risks of each reasonable alternative against those of the proposed action. Additionally, reasonable land use alternatives that emerged from public input during the project scoping phase are documented and briefly discussed. The alternatives that do not meet the project purpose are not advanced for analysis of environmental benefits, costs, and risks. The Environmental Impact Statement Rules, Hawai'i Administrative Rules Chapter 11-200 (HRS 11-200) requires a discussion of alternatives that could attain the objectives of the action, regardless of cost. There is no requirement for the alternatives analysis to consider every possible land use.

Four possible land uses that would not meet the project purpose are discussed. Rezoning the land for resort or residential development, or a potential conservation condemnation are two uses that were examined and eliminated from analysis. These options would not be reasonably viable given the existing private land tenure and existing zoning. Two additional alternatives were considered as reasonable land uses as they could be permitted within the existing State Land Use Agricultural District and County Agricultural Zoning District. These options include Agricultural Park with Processing Center, and development of an Agricultural Subdivision. The alternatives were examined and eliminated from further analysis, however, as they would not fulfill the project purpose.

The analysis, therefore, focuses on alternatives that meet the project purpose. Rigorous exploration and evaluation of the environmental impacts of the alternatives, including those that might enhance environmental quality or avoid, reduce or minimize some or all of the adverse environmental effects, costs and risks. These alternatives include: (1) the development of a Conventional Feedlot Dairy (a non-pasture-based dairy) at the same location; (2) development of the Pasture-Based Dairy at an Alternative Location on Kaua'i; and (3) milk products processing by HDF. The alternative of "No Action" is also evaluated.

The alternatives analysis provides a comprehensive evaluation of the range of potential alternatives, including the two alternative development scenarios. Although the alternatives are potentially reasonable uses under existing zoning and neighboring uses, each fails to comprehensively fulfill the project requirements defined by the eight Project Objectives and the four established Evaluation Criteria (Chapter 2, Sections 2.3.3 and 2.3.4).

The essential differences as compared to the proposed action are highlighted in the following statements.

- Only one of the alternative actions (conventional feedlot alternative) would create a commercial scale dairy operation in Hawai'i, with the capability to produce 10 percent of the State's fresh milk demand thus reducing dependence on imported milk (Objective 1). This alternative, however, would not reduce reliance on costly imported fertilizer and feed (Objective 2); grow local, quality grass as a primary feedstock (Objective 3); and would not utilize 100 percent of manure on site as nutrients to grow forage for dairy cows (Criterion 4).

- None of the alternatives would secure a dairy location that meets the requirements for a pastoral, pasture-based grazing dairy: sufficient contiguous land area; available long-term land tenure; adequate potable water supply; suitable soil properties; gentle slope conditions; and accessibility (Criterion 1).
- One alternative (Agricultural Park) could potentially generate new long-term employment in the agricultural sector on Kaua'i in a wide range of positions including pasture agronomy/soils science, environmental resources management (Criterion 2).
- The Agricultural Park alternative could also develop sustainable food production utilizing Important Agricultural Lands, demonstrating the importance of long-term agricultural leases and capital investment for agricultural infrastructure, water systems and support facilities. (Criterion 3). However, after years of trying, it appears there was limited interest in such a venture.
- Finally, addressing the range of potential environmental impacts (natural, cultural, social and economic) (Objective 8) the two alternative development scenarios would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.

In contrast to the other options considered, the planned agricultural operation of Hawai'i Dairy Farms, was determined to be the most viable option and is the preferred alternative. Of all the alternatives considered, this is the only approach that achieves project objectives and meets each of the four Evaluation Criteria.

- Hawai'i Dairy Farms will create a commercial scale pasture-based dairy operation in Hawai'i, with the capability to provide more than 1,000,000 gallons of the fresh milk demand, reducing dependence on imported milk (Objective 1).
- The planned dairy location meets the requirements of minimum land area, soil properties, slope conditions, water supply, land tenure and availability, and accessibility (Criterion 1).
- The planned action will generate new long-term employment in the agricultural sector on Kaua'i, including pasture agronomy/soils science, veterinary and animal husbandry, environmental resources management, milk/milk processing, and dairy business management (Criterion 2).
- Sustainable food production utilizing Important Agricultural Lands (Criterion 3) will occur with the proposed action, demonstrating the importance of long term agricultural leases, and the ability to draw capital investment for agricultural infrastructure including water systems and support facilities (Criterion 3).
- Address the range of potential environmental impacts by utilizing 100 percent of manure as natural fertilizer to grow the majority of food for cows (Criterion 4). The alternatives evaluated would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.

- Creating an economically viable pasture rotational-grazing model maintains agriculture, retains open space, and provides buffer between highly utilized resort and residential development and sensitive natural or cultural resources (Objective 8).

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

RECEIVED

FEB 23 2015

GROUP 70 INTL

Office of Environmental Quality Control
State Department of Health
1250 Punchbowl Street
Honolulu, HI 96813

I own a home within a few miles of the proposed industrial sized New Zeal and style two thousand cow dairy being planned for Maha'ulepu Valley on the island of Kauai. I have long worked with Malama Maha'ulepu as a volunteer to preserve the precious pristine area of Maha'ulepu for future generations, an area that has been found deserving of such preservation in a federal National Park Survey commissioned by the late senator Inouye. I am extremely concerned about the impending disastrous impact such a dairy will have on both the environment and economy of the surrounding area of residential Koloa town and the world famous Po'ipu resort area.

One of my concerns is with the enormous amount of feces manure and urine waste per cow per day for 365 days per year. The soils are such that they cannot use the amount of waste to fertilize the pasture grasses and so the system is not zero discharge. According to the NRCS study of June 2014, three fifths of the soils within the acreage have been found to be largely clay. The dairy is uphill from the ocean, rainfall per year is significant and runoff of waste into the ocean is very likely. Other soils can carry waste pollution into fresh water wells used by the town of Koloa/Poipu for drinking water.

Additionally, there are protected animals such as the monk seals and marine life of the reefs that will be adversely impacted by polluted waters. Traditional fishing will be affected. The night lighting for milking will negatively affect the shear water birds. There are cultural and historical areas of importance that may be harmed.

There is no known abatement plan for the thousands/millions of flies that will be attracted to the enormous waste. The winds are from the northeast and will blow the stench of the dairy into the resort and residential areas. If visitors stop coming because of the polluted beaches, stench, and flies, businesses will fail, thousands of workers will lose jobs, property values will plummet and the county government will lose a large portion of its tax base. The dairy will be an economic as well as environmental disaster.

The dairy as planned is too big a project (and in fact, is experimental since even the New Zealand investors say 1000 cows should have 1000 acres not 2,000 on 587 acres). The dairy is not only too large and experimental, it is in the wrong place. A populated area and an environmentally precious coastline is a poor choice for such an endeavor.

Finally, HDF claims to be grass fed which is not true since thirty percent of the feed will be grain. It may or may not produce milk for local consumption since once it is shipped off island for processing the milk can be sold anywhere in the world.

A voluntary EIS can be altered from one that is required by the state and cannot be challenged in court. All the technical studies will be done by groups chosen by HDF's group 70 International. None of this inspires confidence that the EIS will be objective.

I am writing this letter to insure that I have the right to comment on the EIS in the future.

Sincerely, Sara DeZerega, Koloa
cc: Group 70 International, Inc. and Hawaii Dairy Farms, LLC, Garden Island newspaper

GROUP 70
INTERNATIONAL

May 26, 2016

Sara DeZerega
3018 Laua'e Place
Koloa, HI 96756

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Sara DeZerega:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

DAIRY OPERATIONS: Hawai'i Dairy Farms (HDF) will establish and operate a sustainable, pastoral rotational-grazing dairy farm in Māhā'ulepū Valley on the island of Kaua'i to produce fresh, locally available nutritious milk for Hawai'i families. The rotational-grazing method utilizes 100 percent of the cows' manure as natural fertilizer to grow pasture grass as a primary source of nutrition for dairy cows. This cost-effective method will reduce reliance on imported fertilizer and feed. Pasture grass will comprise at least 70 percent of the animals' diet. As a part of the Draft Environmental Impact Statement (EIS), the proposed facilities and operations for the dairy farm are described in Chapter 3.

The Environmental Impact Statement (EIS) Preparation Notice (EISPN), published January 23, 2015, described the proposed pasture-based rotational grazing system as a "zero-discharge, grass-fed dairy". The term "zero-discharge" under the U.S.

Environmental Protection Agency related to concentrated feeding operations (CAFO) is a system designed to not discharge pollutants into waters of the United States. As noted previously, the HDF system is designed to utilize 100 percent of the cows' manure on-site. However, nutrients would be introduced to the HDF site with any use; the Draft EIS identifies the amount of nutrients anticipated from the proposed dairy operations that could pass through to ground and surface waters. Therefore, HDF elected to discontinue use of the term "zero discharge" as it was construed as no nutrients into the system.

The term "grass-fed" was used in the HDF EISPN. This term was used to identify HDF's intent to utilize a locally-produced feedstock – grass – for more than 70 percent of the dairy herds' diet. In January 2016, the U.S. Department of Agricultural (USDA) Marketing Survey created a narrow legal definition of "grass-fed". The USDA standard defines what animals can and cannot be fed. The Food Alliance, a project of several northwest colleges, believes that when consumers choose grass-fed products there is an expectation that these will come from animals raised on pasture on a forage-based diet. Due to the evolving definition of "grass-fed", the term in not used in this EIS.

The dairy facilities will occupy an area of approximately 10 acres on the western boundary of the site. The developed area "footprint" will be less than 2 percent of the total farm area. Four buildings will be constructed to serve different functions, supported by utilities and infrastructure. Additional building information can be found in Draft EIS Section 3.3.1.

Agricultural infrastructure and utilities required for the dairy operations will include storage tanks and silos, effluent storage ponds, livestock water systems, and drainage improvements. The irrigation system and distribution of livestock water are discussed in Draft EIS Section 3.5, Pasture Management.

The pastoral rotational-grazing dairy provides a local feedstock – grass – as the herd's primary food source. Reducing imported feed stabilizes costs and provides a food source closer to the natural diet of cows. Results of grass trials initially conducted at five sites across four Hawaiian Islands were instrumental in identifying appropriate varieties of grass, and suitable sites to support sufficient "dry matter" grass yields essential to a cow's diet. Additional project-specific trials at the Māhāʻulepū site on Kauai have been conducted for more than 18 months. The results have identified sufficient yield and nutrition to supply 70 percent of the cows' diet; improvements in grass productivity are anticipated to provide up to 85 percent of cows' diet.

The pasture-based model allows cows to move about freely, and to lie down and rest, which is part of the digestion cycle. The animals are managed in social groups known as "mobs", mimicking the natural social order of bovines. Cows spend 22 hours of each 24-hour period foraging on pasture or resting, outdoors in natural light and fresh air. The gently sloped paddocks, walkways and races minimize the energy expended by the mature dairy cows as they graze or are transferred to and from the various paddocks and the mature dairy facility; surfaces of the walkways and cow races are designed to provide a comfortable path under hoof. The

management practices and pasture model applied by HDF maximizes grass as the cows' primary nutrition source and minimizes stress to the animals. Cows tend to be healthier and live longer, productive lives with access to fresh air, high quality feed, and exercise while they forage.

The 470 acres of pasture will be divided into paddocks averaging 3 to 5 acres in size. Smaller paddocks located near the dairy facility will be used as temporary pasture for cows or calves being moved on or off the farm. To protect the water quality of surface water and downstream areas, paddock fences are set back 35 feet from the edge of drainage ways throughout the site. Existing vegetation within the setbacks will be managed or restored to reduce erosion, improve stability of ditch banks, increase net carbon storage, and improve and maintain water quality.

The majority of the pastures will be irrigated with non-potable water and/or diluted effluent through either the pivot irrigation systems or through gun irrigators. Irrigation water supply is provided to the farm from Waita Reservoir, and will be filtered and pumped to the various irrigation components on the farm. The irrigation system is controlled using computer software and GPS receivers to allow very precise application of irrigation and/or diluted effluent on the pasture. The pivots can rotate and apply irrigation water and/or diluted effluent at different rates depending on the actual irrigation needs of the farm.

NRCS provides technical guidance on applying agricultural waste depending on the desired use of the waste. Reflected in the title of the livestock waste guidance for Hawaiʻi is the parenthetical inclusion of the word "nutrients." Where waste is utilized as a resource, it is being used for the constituent components that provide benefit.

The NRCS Conservation Practice Standard 590, Nutrient Management, applies to commercial fertilizers, organic by-products, waste water, organic matter, and irrigation water. Nutrient management is the practice of managing the amount, rate, source, method of application, and timing of plant nutrients and soil amendments. The timing and application of nutrients will correspond with plant uptake, soil properties and weather conditions. For more information on nutrient balance management see Draft EIS Section 3.5.3, and Draft EIS Appendix D.

The effluent storage ponds are sized to accommodate 30 days of storage for up to 2,000 mature dairy cows, and over 85 days of storage for 699 mature dairy cows. It will be highly unlikely that the storage pond will be full at any time for the contemplated 2,000-cow dairy, and nearly impossible for the committed 699-cow dairy. Throughout the less than 30-day storage period, effluent is planned for application every four days, and the slurry application is expected at least once every 45 days, to ensure that the ponds are kept at manageable levels.

Cows lactate milk following the birth of calves. Newborn calves will be housed on the Māhāʻulepū site and provided essential colostrum and nutrients for a healthy start. During the calves' initial 90 days, they will be transitioned to pasture at HDF before transfer to ranches on Kauaʻi to be raised off-site. The committed herd size of 699 mature dairy cows at the Māhāʻulepū site applies to mature mature dairy cows.

Animals in various stages of lactation and rest will be transferred between HDF and other partner ranches as needed for animal health and dairy productivity. This will benefit both the dairy and infuse the beef market in Hawai'i with a new, local source of pasture-raised calves. Male calves will become part of the beef cattle herd; heifers (young female calves that haven't given birth) will be raised until ready to return to the HDF herd as a birthing/mature dairy cow. For more information on off-site herd management, refer to Section 3.7 of the Draft EIS.

Health of the herd is of primary importance as the success of a dairy relies on cows effectively producing quality milk. All cows will be treated with a high standard of care. Dairy managers and caretakers will be trained and competent in handling animals to minimize stress and ensure the herds' welfare. A licensed veterinarian may prescribe use of antibiotics approved by the Food & Drug Administration (FDA) for treatment of illnesses. Adherence to guidelines that prohibit milk from cows undergoing antibiotic treatment will ensure no adulteration of milk. Routine laboratory tests of milk for traces of antibiotic residue will be conducted. HDF will not inject cows with bovine growth hormone, referred to as rBST or rBGH.

SOILS: Soil is an ecosystem that can be managed to provide nutrients for plant growth, to absorb and hold rainwater for use during dryer periods, to filter and buffer potential pollutants from leaving fields, to serve as a firm foundation for agricultural activities, and to provide habitat for soil microbes to flourish and diversify to keep the ecosystem healthy. Two rounds of independent soil sampling were undertaken at HDF to understand and characterize available soil nutrients and conditions. Section 4.3 of the Environmental Impact Statement (EIS) characterizes soil conditions, and anticipated impacts from effluent and supplemental nutrient application. Recommendations from Dr. Russell Yost and Nicholas Krueger of the University of Hawai'i at Mānoa are summarized. Their baseline nutrient report is included as Appendix C of the Draft EIS.

Soil conservation is a core principal behind establishment of the NRCS, which was formed out of the Soil Conservation Service to acknowledge its expanded role in watershed-scale approach using science-based tools and standards in agronomy, engineering economics, wildlife biology and other disciplines to aid landowners in implementation of conservation practices. NRCS conservation practices are listed in Chapter 3, Section 3.2; these practices codes identify design and construction standards related to drainage, materials, operations and applicable engineering standards. HDF will follow the developed Conservation Plan, which was approved by the West Kaua'i Soil & Water Conservation District in December, 2013.

The United States Department of Agriculture (USDA) Natural Resources Conservation Services (NRCS) has mapped and classified soils for more than 95 percent of the United States. Comments received during the initial scoping for this EIS included a "Custom Soils Resource Report for Island of Kaua'i, Hawai'i." The report was generated from the USDA NRCS website, which allows any internet user to define an area of interest, customize data results, and generate a Custom Soil Resource Report. The user can select or deselect parameters based upon which data the user would like to display. These user-generated reports are not evaluated by NRCS.

The NRCS soils classifications and descriptions provide a good information base, however, in-field soils testing is needed to identify existing soil nutrient levels and conditions. The most abundant soil types at the HDF site are Kalihi Clay at 32 percent, Ka'ena Clay Brown Variant at 29 percent, and Lualualei Clay at roughly 14 percent of the dairy site. Laboratory analysis of soil samples collected in 2014 identified levels of pH, phosphorus, nitrogen, potassium, calcium, magnesium, organic matter, salinity, micronutrients and other constituents. The results illustrate that the soils are depleted of nutrients, which is typical for lands formerly used for sugarcane. The soil nutrient status and fertility demands of the primary crop, Kikuyu grass, were used to identify the quantities of nutrients required for productive grass growth. The soils data provide a baseline to guide adaptive nutrient management throughout establishment and maturity of the dairy.

A second round of field sampling was conducted in 2015, and focused on evaluation of soils characterized as "poorly drained", and established a quantitative baseline of soil salinity and sodicity to provide for future monitoring of soil health with application of manure effluent. Laboratory analysis determined electrical conductivity and exchangeable sodium percentage, in addition to nutrient levels of nitrogen phosphorus calcium, magnesium, and potassium.

Poorly drained is not an indication of low or poor infiltration. Infiltration refers to the ability of water to enter the soil surface, whereas "drainage" refers to the movement of water within or from the soil profile. Poorly drained soils typically have low hydraulic conductivity, or a slow rate of groundwater movement through the soil. This slow movement can create anaerobic conditions, which typically result in higher rates of denitrification. This is the conversion of potentially nitrates and nitrites to gaseous forms, which reduces the potential for impacts on waterbodies. In this way, "poorly drained" soils may represent less risk of nitrate and nitrite leaching to associated waterbodies than "well drained" soils (Yost, 2016).

As a result of reduced movement of water through the soil profile, the mobility of nutrients such as potassium and phosphorus is also reduced. Soil types at the HDF site are known to adsorb and retain large amounts of phosphorus. Under the NRCS phosphorus leaching index for Hawai'i soils, HDF soils show low risk for leaching. With low risk, phosphorus can be applied at rates greater than crop requirements if manure or other organic materials are used to supply nutrients.

The dairy's focus on robust and healthy grass growth will build organic matter in soils through use of manure as a natural fertilizer. Soil can incorporate carbon from the atmosphere, which benefits soil health. According to recent studies in the Soil Science Society of America Journal, the conversion of formerly tilled cropland to grazed pasture can drive substantial accumulation of organic carbons in soil, with a potential to offset up to one-third of the annual increase in atmospheric carbon dioxide. The potential soil organic matter and carbon dioxide sequestration benefits are likely greatest in highly degraded soils in warm subtropical climates, partly due to long pasture-growing seasons. Long-term soil impacts are anticipated to result in improvement to the physical, chemical, and biological condition of the soil.

ARCHAEOLOGICAL AND CULTURAL: The Hawai'i Dairy Farms (HDF) project is subject to a historic preservation review by the State Department of Land and Natural Resources, State Historic Preservation Division (SHPD) under HRS Chapter 6E and Chapter 13-284. An Archaeological Inventory Survey (AIS) and a Cultural Impact Assessment (CIA) were conducted by Scientific Consultant Services (SCS) for the proposed project. EIS Sections 4.7 and 4.8 provide an evaluation of archaeology and cultural resources, with technical studies in Appendix G and H.

A total of sixteen historic properties were identified through a pedestrian survey of the project area and an extended survey area of 100 meters of the northern boundary. Six historic-era sites occur in the project area and 10 sites occur in the extended survey area. Only one of the sites is believed to be associated with pre-Contact and/or early historic times. State Site 50-30-10-2250, the agricultural heiau, and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area. The remaining sites consist of historic-era bridges, ditches, culverts, retaining walls, and a flume system dating from the 20th century and are affiliated with sugarcane cultivation.

That a majority of the documented sites are related to the historic-era is not surprising, given the massive landscape modifications that occurred during intensive sugarcane cultivation on the valley floor. Even historic era cultural materials associated with the many Land Commission Awards in the project area were non-existent, as explored through survey and subsurface exploration.

The sixteen historic properties have been assessed for significance by the archaeological consultant and the dairy project is anticipated to have no impact on these sites. No further archaeological work is recommended for the sites. Two of the sixteen sites are considered significant under multiple criteria, but occur outside the project area on lands owned by a different landowner. Both sites will not be adversely affected by the proposed dairy project. No site is related to burials, and no bonex were found. Such sites have been reported along coastal areas in sand dunes.

The cultural assessment examined the potential effect of the project on cultural resources, practices or beliefs, its potential to isolate cultural resources, practices or beliefs from their setting, and the potential of the project to introduce elements which may alter the setting in which cultural practices take place. Information received from the community indicates the Māhā'ulepū Ahupua'a, has been and is currently used for traditional cultural purposes. However, the dairy project area has not been included in these activities. It is clear that the gathered plants, trails, State Site 50-30-10-2250, the agricultural heiau, and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area.

The project will be fully enclosed by perimeter fencing along the boundary of the leased premises, which will ensure that project activities and any related impacts are contained within the project area. Based on the research and comments received from the community, it is reasonable to conclude that, pursuant to Act 50, the exercise of native Hawaiian rights or any ethnic group related to numerous traditional cultural practices will not be impacted by establishment of the dairy.

FLORA AND FAUNA: Botanical, avian, and mammalian surveys of the property were conducted for the Draft Environmental Impact Statement (EIS) to assess existing species on site, including identifying any species listed as endangered, threatened, or proposed under any state or federal endangered species programs in or near the property. EIS Sections 4.9 and 4.10 address the evaluation of flora and fauna resources, with technical studies in Appendix A and B.

A botanical survey of the dairy property was conducted in August 2014 by AECOS Consulting to assess existing plant species. The survey also investigated for the presence of plants currently listed as endangered, threatened or proposed for listing under Federal or the State of Hawai'i's endangered species programs, located onsite or within the immediate vicinity of the dairy site. The nature of the land and its present and historical uses for intensive agriculture very much limit the natural botanical resources anticipated to occur on this land. Complete species lists are included in the EIS, and no protected botanical species occur on the project property. The project will include vegetated buffer strips along the drainage ways as part of the Conservation Plan to reduce erosion and stabilize slopes. Where native plants occur or could survive if planted, native plants will be used in the stabilization. No long-term impacts to native plant habitats or endangered or threatened plants species will occur as a result of the dairy.

Avian and mammalian surveys were conducted in August 2014 by Rana Biological Consulting, Inc. This survey was conducted to assess the potential presence of avian or mammalian species currently listed as endangered, threatened or proposed for listing under either Federal or the State endangered species lists. The survey covered the dairy site area and immediate vicinity. Common birds and terrestrial mammals were encountered on the property. There is no critical habitat for endangered species in the upper Māhā'ulepū Valley.

Four species of endangered waterbirds were recorded on the site and at the nearby taro farm located within the HDF site. Though the area does not provide critical habitat, seabirds that nest in upland areas of Kauai may overfly the site. The endangered Hawaiian goose, nēnē was also seen on the site. State Division of Forestry and Wildlife biologists have noted nēnē are regularly seen on the subject property. It is probable that some nest on or adjacent to the site as this species nests in the general Kōloa area, and the habitat present on parts of the site is suitable for nēnē nesting.

The principal potential impacts posed to the five endangered species include those potentially associated with construction activities, and those associated with dairy farm operations following build-out. Measures will be adopted to avoid potential seabird and nēnē goose collisions with fences and structures. Potential measures include lowering construction cranes at night, using conservation fencing to project-specified areas, marking tall structures and fencing with white visibility polytape, limiting nighttime lighting, and shading any outside lights used at night. Ongoing mitigation strategies will be implemented for day-to-day preventative measures, including an Avian Species Protection Plan. Mitigation measures are further described in DEIS Section 4.10.2.

It is also likely that Hawaiian hoary bats overfly the project area on a seasonal basis. While caution will be taken during any potential disturbance or vegetation removal, there are almost no suitable roost trees within the dairy site, thus it is expected that the dairy farm will not affect this listed mammalian species.

DEMOGRAPHIC AND ECONOMIC: The potential impacts of Hawai'i Dairy Farms (HDF) to the existing economy were evaluated in the Draft Environmental Impact Statement (EIS), including a fiscal impact assessment report completed in April, 2016 by Plasch Economics Pacific. Draft EIS Section 4.15 addresses demographic and economic factors, with the complete report in Appendix J.

The HDF project would create short-term benefits through jobs for local construction personnel and local material suppliers. Such jobs would include equipment operators, cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, supervisors, painters, etc. Based on State employment multipliers, indirect employment related to Dairy construction would be expected to average about 16 jobs on Kaua'i, and 8 on O'ahu. Construction employment would be expected to average about 12 jobs per year during the development period. Thus direct-plus-indirect employment association with construction would be expected to average approximately 36 jobs, of which 28 would be on Kaua'i.

The HDF project would contribute to diversification of Kaua'i's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Hawai'i Island), approximately10 percent of Hawai'i's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and indirect full-time equivalent jobs on Kaua'i, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on O'ahu.

HDF is expected to generate a net income of approximately $68,000 to the County when the 699 cow herd is established. When the dairy has matured to full production for the 699 cow dairy, net income to the State is calculated at $160,000 annually. With the potential contemplated herd size of up to 2,000 mature dairy cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be produced. This would double local milk production currently supplied by operational dairies on the Island of Hawai'i.

Additional employment generated by a possible expansion to accommodate the contemplated 2,000 mature dairy cow herd is estimated at approximately 3 construction jobs plus 4 indirect jobs on Kaua'i, and 2 indirect jobs on O'ahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an additional 5 full-time farm jobs would be added, with approximately 15 additional indirect jobs on Kaua'i and another 8 indirect jobs on O'ahu.

The dairy is expected to generate a net additional contribution to the County of

approximately $8,000 for improvements related to expansion for the contemplated herd size of up to 2,000 mature dairy cows ($76,000 total versus $68,000 for the committed herd size). The State will derive approximately $360,000 annually in revenues from the contemplated 2,000-mature dairy cow dairy.

Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhā'ulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhā'ulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Po'ipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhā'ulepū may be connected. Four studies were

conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawai'i Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhā'ulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhā'ulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhā'ulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kaua'i community.

Regional Water Demand: The adjacent, developed Kōloa-Po'ipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kaua'i will increase county-wide by 17,300 residents by 2030. The South Kaua'i population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kaua'i region (the Kōloa - Po'ipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an

increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhā'ulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhā'ulepū watershed.

The HDF site is located on the bottom-land of the upper Māhā'ulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Ha'upu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhā'ulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kaua'i Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhā'ulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhā'ulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has

completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhāʻulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter

periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Poʻipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kauaʻi community.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

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Group 70 International
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925 Bethel St., 5th Floor
Honolulu, HI 96813

SUBJECT: Hawaii Dairy Farms' Voluntary EIS Preparation Notice

Aloha Laura McIntyre and Jeff Overton,

I wish to be a consultant party for the draft EIS.

We live in Koloa and I am a longtime volunteer with Malama Maha`ulepu. I have worked on many stewardship activities at Maha`ulepu, from weeding and watering native plant restoration projects to beach clean-ups. I have helped with educational outreach for this beautiful undeveloped coastline from participation in the Koloa Plantation Days' events to powerpoint presentations for students.

I love Maha`ulepu and see the priceless value in this rich cultural landscape as an undeveloped area for public access, cultural restoration and compatible uses. We must have a place where people can enjoy personal restoration and recreational activities. Our local community, fisherman, waterman, and visitors count on there being an undeveloped area of original landscape.

As much as I would love to see compatible agriculture on this rich valley, like a diversified food forest, the Hawaii Dairy Farms plan carries great concern.

From the beginning of our knowledge about the plan for a dairy in Maha`ulepu Valley, I approached with an open mind. We want ag, it is zoned ag. I rode along on a small tour in February, 2014. With each question and answer, my concern was growing. The herd size, the concentrated grazing areas, the conditions, the soil types and the containment

facts were much different than what we were presented earlier. I am very concerned about the impacts.
Specific points that I believe need to be addressed in the draft EIS are as follows:

1. I am very concerned about the potential for water quality contamination of our drinking water and run off. This carries concerns also about the public health of Koloa/Poipu residents and our tap water and beaches and aquatic life.

2. I am concerned about the location of the milking area and waste ponds. They are very, very close to the aquifer. I would like to see the data examined for the harmful impacts of the waste ponds in regards to leaching into the aquifer and overall cleanliness of holding waste in this manner.

3. The amount of water consumed for operation is enormous. The dairy may feel they own the self-replenishing aquifers and all the water they want from the Waita Reservoir, but they don't. I question why we would use such a large amount of our water resources on yet another type of agriculture that leaves our island and gives us nothing to eat. Please include in the EIS a water usage analysis.

4. The EIS must include the consideration of other reasonable locations both on Kaua`i and perhaps also on the other islands, including the island it will be ultimately processed and packaged on.

5. The EIS must include detailed and accurate soil and hydrological data of the entire ahupua`a of Maha`ulepu. It must address the complete watershed, including the lava tube system, and show that no run off will occur under any circumstance.

6. We must include study and disclosure about what integrated pest management plan for fly control, and if this would require the potential for pesticide application.

7. The importance of Maha`ulepu to the south shore for the residents, fisherman, geologists, archeologists, the students and the visitors, should require that bonding mitigation measures are in place, such as an environmental remediation bond and continual monitoring protocols. Such monitoring and sampling must include community involvement and disclosure.

8. The EIS must include environmental indicators and metrics to determine what size of a herd the land and resources can support without damaging the ecology of the valley and the surrounding towns.

9. The EIS must include plans for site remediation for when the lease ends. Site remediation must include a guarantee from HDF that Maha`ulepu will be fully restored to its current condition. A remediation fund should be required to cover the costs of damage or impact to its natural state.

10. We must study the impacts on cultural practices, cultural sites, hunting, and hiking. The ahupua`a of Maha`ulepu as the last remaining, easily accessible, undeveloped coastline deserves our highest stewardship. It is a natural and living museum. It is an important example of how things used to be. It provides unparalleled beauty and outdoor classroom for our local children.

11. I would like for the EIS to include encouragement for the HDF plan to avoid the importation and feeding of genetically engineered corn for cow feed. Consumers are seeking out truly grass fed dairy milk and they avoid milk from GE grains. Alternatives exist. If the milk produced did not include GE grains, there could be a local use for the milk fat to remain on island and become a value added product like yogurt,

Please keep in mind that we would know the importance of food security and ecological soundness and historical conservation. I feel that this plan from HDF provides none of these measures. It is the wrong location for a model that takes from important resources and leaves the community with only negative impacts. I can see no community benefit.

Thank you for incorporating these comments into the draft EIS scoping project. Please remember, or visit, this special site. I am sure you understand the significance of this area, not only our community, but to future generations.

Mahalo and aloha `aina,

Jeri A. Di Pietro

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May 26, 2016

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Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Jeri Di Pietro:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

DAIRY OPERATIONS: Hawai'i Dairy Farms (HDF) will establish and operate a sustainable, pastoral rotational-grazing dairy farm in Māhā'ulepū Valley on the island of Kaua'i to produce fresh, locally available nutritious milk for Hawai'i families. The rotational-grazing method utilizes 100 percent of the cows' manure as natural fertilizer to grow pasture grass as a primary source of nutrition for dairy cows. This cost-effective method will reduce reliance on imported fertilizer and feed. Pasture grass will comprise at least 70 percent of the animals' diet. As a part of the Draft Environmental Impact Statement (EIS), the proposed facilities and operations for the dairy farm are described in Chapter 3.

The Environmental Impact Statement (EIS) Preparation Notice (EISPN), published January 23, 2015, described the proposed pasture-based rotational grazing system

as a "zero-discharge, grass-fed dairy". The term "zero-discharge" under the U.S. Environmental Protection Agency related to concentrated feeding operations (CAFO) is a system designed to not discharge pollutants into waters of the United States. As noted previously, the HDF system is designed to utilize 100 percent of the cows' manure on-site. However, nutrients would be introduced to the HDF site with any use; the Draft EIS identifies the amount of nutrients anticipated from the proposed dairy operations that could pass through to ground and surface waters. Therefore, HDF elected to discontinue use of the term "zero discharge" as it was construed as no nutrients into the system.

The term "grass-fed" was used in the HDF EISPN. This term was used to identify HDF's intent to utilize a locally-produced feedstock – grass – for more than 70 percent of the dairy herds' diet. In January 2016, the U.S. Department of Agricultural (USDA) Marketing Survey created a narrow legal definition of "grass-fed". The USDA standard defines what animals can and cannot be fed. The Food Alliance, a project of several northwest colleges, believes that when consumers choose grass-fed products there is an expectation that these will come from animals raised on pasture on a forage-based diet. Due to the evolving definition of "grass-fed", the term in not used in this EIS.

The dairy facilities will occupy an area of approximately 10 acres on the western boundary of the site. The developed area "footprint" will be less than 2 percent of the total farm area. Four buildings will be constructed to serve different functions, supported by utilities and infrastructure. Additional building information can be found in Draft EIS Section 3.3.1.

Agricultural infrastructure and utilities required for the dairy operations will include storage tanks and silos, effluent storage ponds, livestock water systems, and drainage improvements. The irrigation system and distribution of livestock water are discussed in Draft EIS Section 3.5, Pasture Management.

The pastoral rotational-grazing dairy provides a local feedstock – grass – as the herd's primary food source. Reducing imported feed stabilizes costs and provides a food source closer to the natural diet of cows. Results of grass trials initially conducted at five sites across four Hawaiian Islands were instrumental in identifying appropriate varieties of grass, and suitable sites to support sufficient "dry matter" grass yields essential to a cow's diet. Additional project-specific trials at the Māhā'ulepū site on Kauai have been conducted for more than 18 months. The results have identified sufficient yield and nutrition to supply 70 percent of the cows' diet; improvements in grass productivity are anticipated to provide up to 85 percent of cows' diet.

The pasture-based model allows cows to move about freely, and to lie down and rest, which is part of the digestion cycle. The animals are managed in social groups known as "mobs", mimicking the natural social order of bovines. Cows spend 22 hours of each 24-hour period foraging on pasture or resting, outdoors in natural light and fresh air. The gently sloped paddocks, walkways and races minimize the energy expended by the mature dairy cows as they graze or are transferred to and from the various paddocks and the mature dairy facility; surfaces of the walkways

and cow races are designed to provide a comfortable path under hoof. The management practices and pasture model applied by HDF maximizes grass as the cows' primary nutrition source and minimizes stress to the animals. Cows tend to be healthier and live longer, productive lives with access to fresh air, high quality feed, and exercise while they forage.

The 470 acres of pasture will be divided into paddocks averaging 3 to 5 acres in size. Smaller paddocks located near the dairy facility will be used as temporary pasture for cows or calves being moved on or off the farm. To protect the water quality of surface water and downstream areas, paddock fences are set back 35 feet from the edge of drainage ways throughout the site. Existing vegetation within the setbacks will be managed or restored to reduce erosion, improve stability of ditch banks, increase net carbon storage, and improve and maintain water quality.

The majority of the pastures will be irrigated with non-potable water and/or diluted effluent through either the pivot irrigation systems or through gun irrigators. Irrigation water supply is provided to the farm from Waita Reservoir, and will be filtered and pumped to the various irrigation components on the farm. The irrigation system is controlled using computer software and GPS receivers to allow very precise application of irrigation and/or diluted effluent on the pasture. The pivots can rotate and apply irrigation water and/or diluted effluent at different rates depending on the actual irrigation needs of the farm.

NRCS provides technical guidance on applying agricultural waste depending on the desired use of the waste. Reflected in the title of the livestock waste guidance for Hawai'i is the parenthetical inclusion of the word "nutrients." Where waste is utilized as a resource, it is being used for the constituent components that provide benefit.

The NRCS Conservation Practice Standard 590, Nutrient Management, applies to commercial fertilizers, organic by-products, waste water, organic matter, and irrigation water. Nutrient management is the practice of managing the amount, rate, source, method of application, and timing of plant nutrients and soil amendments. The timing and application of nutrients will correspond with plant uptake, soil properties and weather conditions. For more information on nutrient balance management see Draft EIS Section 3.5.3, and Draft EIS Appendix D.

The effluent storage ponds are sized to accommodate 30 days of storage for up to 2,000 mature dairy cows, and over 85 days of storage for 699 mature dairy cows. It will be highly unlikely that the storage pond will be full at any time for the contemplated 2,000-cow dairy, and nearly impossible for the committed 699-cow dairy. Throughout the less than 30-day storage period, effluent is planned for application every four days, and the slurry application is expected at least once every 45 days, to ensure that the ponds are kept at manageable levels.

Cows lactate milk following the birth of calves. Newborn calves will be housed on the Māhā'ulepū site and provided essential colostrum and nutrients for a healthy start. During the calves' initial 90 days, they will be transitioned to pasture at HDF before transfer to ranches on Kaua'i to be raised off-site. The committed herd size of

699 mature dairy cows at the Māhā'ulepū site applies to mature mature dairy cows. Animals in various stages of lactation and rest will be transferred between HDF and other partner ranches as needed for animal health and dairy productivity. This will benefit both the dairy and infuse the beef market in Hawai'i with a new, local source of pasture-raised calves. Male calves will become part of the beef cattle herd; heifers (young female calves that haven't given birth) will be raised until ready to return to the HDF herd as a birthing/mature dairy cow. For more information on off-site herd management, refer to Section 3.7 of the Draft EIS.

Health of the herd is of primary importance as the success of a dairy relies on cows effectively producing quality milk. All cows will be treated with a high standard of care. Dairy managers and caretakers will be trained and competent in handling animals to minimize stress and ensure the herds' welfare. A licensed veterinarian may prescribe use of antibiotics approved by the Food & Drug Administration (FDA) for treatment of illnesses. Adherence to guidelines that prohibit milk from cows undergoing antibiotic treatment will ensure no adulteration of milk. Routine laboratory tests of milk for traces of antibiotic residue will be conducted. HDF will not inject cows with bovine growth hormone, referred to as rBST or rBGH.

SOILS: Soil is an ecosystem that can be managed to provide nutrients for plant growth, to absorb and hold rainwater for use during dryer periods, to filter and buffer potential pollutants from leaving fields, to serve as a firm foundation for agricultural activities, and to provide habitat for soil microbes to flourish and diversify to keep the ecosystem healthy. Two rounds of independent soil sampling were undertaken at HDF to understand and characterize available soil nutrients and conditions. Section 4.3 of the Environmental Impact Statement (EIS) characterizes soil conditions, and anticipated impacts from effluent and supplemental nutrient application. Recommendations from Dr. Russell Yost and Nicholas Krueger of the University of Hawai'i at Mānoa are summarized. Their baseline nutrient report is included as Appendix C of the Draft EIS.

Soil conservation is a core principal behind establishment of the NRCS, which was formed out of the Soil Conservation Service to acknowledge its expanded role in watershed-scale approach using science-based tools and standards in agronomy, engineering economics, wildlife biology and other disciplines to aid landowners in implementation of conservation practices. NRCS conservation practices are listed in Chapter 3, Section 3.2; these practices codes identify design and construction standards related to drainage, materials, operations and applicable engineering standards. HDF will follow the developed Conservation Plan, which was approved by the West Kaua'i Soil & Water Conservation District in December, 2013.

The United States Department of Agriculture (USDA) Natural Resources Conservation Services (NRCS) has mapped and classified soils for more than 95 percent of the United States. Comments received during the initial scoping for this EIS included a "Custom Soils Resource Report for Island of Kaua'i, Hawai'i." The report was generated from the USDA NRCS website, which allows any internet user to define an area of interest, customize data results, and generate a Custom Soil Resource Report. The user can select or deselect parameters based upon which data

the user would like to display. These user-generated reports are not evaluated by NRCS.

The NRCS soils classifications and descriptions provide a good information base, however, in-field soils testing is needed to identify existing soil nutrient levels and conditions. The most abundant soil types at the HDF site are Kalihi Clay at 32 percent, Ka'ena Clay Brown Variant at 29 percent, and Lualualei Clay at roughly 14 percent of the dairy site. Laboratory analysis of soil samples collected in 2014 identified levels of pH, phosphorus, nitrogen, potassium, calcium, magnesium, organic matter, salinity, micronutrients and other constituents. The results illustrate that the soils are depleted of nutrients, which is typical for lands formerly used for sugarcane. The soil nutrient status and fertility demands of the primary crop, Kikuyu grass, were used to identify the quantities of nutrients required for productive grass growth. The soils data provide a baseline to guide adaptive nutrient management throughout establishment and maturity of the dairy.

A second round of field sampling was conducted in 2015, and focused on evaluation of soils characterized as "poorly drained", and established a quantitative baseline of soil salinity and sodicity to provide for future monitoring of soil health with application of manure effluent. Laboratory analysis determined electrical conductivity and exchangeable sodium percentage, in addition to nutrient levels of nitrogen phosphorus calcium, magnesium, and potassium.

Poorly drained is not an indication of low or poor infiltration. Infiltration refers to the ability of water to enter the soil surface, whereas "drainage" refers to the movement of water within or from the soil profile. Poorly drained soils typically have low hydraulic conductivity, or a slow rate of groundwater movement through the soil. This slow movement can create anaerobic conditions, which typically result in higher rates of denitrification. This is the conversion of potentially nitrates and nitrites to gaseous forms, which reduces the potential for impacts on waterbodies. In this way, "poorly drained" soils may represent less risk of nitrate and nitrite leaching to associated waterbodies than "well drained" soils (Yost, 2016).

As a result of reduced movement of water through the soil profile, the mobility of nutrients such as potassium and phosphorus is also reduced. Soil types at the HDF site are known to adsorb and retain large amounts of phosphorus. Under the NRCS phosphorus leaching index for Hawai'i soils, HDF soils show low risk for leaching. With low risk, phosphorus can be applied at rates greater than crop requirements if manure or other organic materials are used to supply nutrients.

The dairy's focus on robust and healthy grass growth will build organic matter in soils through use of manure as a natural fertilizer. Soil can incorporate carbon from the atmosphere, which benefits soil health. According to recent studies in the Soil Science Society of America Journal, the conversion of formerly tilled cropland to grazed pasture can drive substantial accumulation of organic carbons in soil, with a potential to offset up to one-third of the annual increase in atmospheric carbon dioxide. The potential soil organic matter and carbon dioxide sequestration benefits are likely greatest in highly degraded soils in warm subtropical climates, partly due

to long pasture-growing seasons. Long-term soil impacts are anticipated to result in improvement to the physical, chemical, and biological condition of the soil.

ARCHAEOLOGICAL AND CULTURAL: The Hawai'i Dairy Farms (HDF) project is subject to a historic preservation review by the State Department of Land and Natural Resources, State Historic Preservation Division (SHPD) under HRS Chapter 6E and Chapter 13-284. An Archaeological Inventory Survey (AIS) and a Cultural Impact Assessment (CIA) were conducted by Scientific Consultant Services (SCS) for the proposed project. EIS Sections 4.7 and 4.8 provide an evaluation of archaeology and cultural resources, with technical studies in Appendix G and H.

A total of sixteen historic properties were identified through a pedestrian survey of the project area and an extended survey area of 100 meters of the northern boundary. Six historic-era sites occur in the project area and 10 sites occur in the extended survey area. Only one of the sites is believed to be associated with pre-Contact and/or early historic times. State Site 50-30-10-2250, the agricultural heiau, and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area. The remaining sites consist of historic-era bridges, ditches, culverts, retaining walls, and a flume system dating from the 20th century and are affiliated with sugarcane cultivation.

That a majority of the documented sites are related to the historic-era is not surprising, given the massive landscape modifications that occurred during intensive sugarcane cultivation on the valley floor. Even historic era cultural materials associated with the many Land Commission Awards in the project area were non-existent, as explored through survey and subsurface exploration.

The sixteen historic properties have been assessed for significance by the archaeological consultant and the dairy project is anticipated to have no impact on these sites. No further archaeological work is recommended for the sites. Two of the sixteen sites are considered significant under multiple criteria, but occur outside the project area on lands owned by a different landowner. Both sites will not be adversely affected by the proposed dairy project. No site is related to burials, and no bonex were found. Such sites have been reported along coastal areas in sand dunes.

The cultural assessment examined the potential effect of the project on cultural resources, practices or beliefs, its potential to isolate cultural resources, practices or beliefs from their setting, and the potential of the project to introduce elements which may alter the setting in which cultural practices take place. Information received from the community indicates the Māhā'ulepū Ahupua'a, has been and is currently used for traditional cultural purposes. However, the dairy project area has not been included in these activities. It is clear that the gathered plants, trails, State Site 50-30-10-2250, the agricultural heiau, and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area.

The project will be fully enclosed by perimeter fencing along the boundary of the leased premises, which will ensure that project activities and any related impacts are contained within the project area. Based on the research and comments received from the community, it is reasonable to conclude that, pursuant to Act 50, the

exercise of native Hawaiian rights or any ethnic group related to numerous traditional cultural practices will not be impacted by establishment of the dairy.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhā'ulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhā'ulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Po'ipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhā'ulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million

gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawai'i Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhā'ulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhā'ulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhā'ulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kaua'i community.

Regional Water Demand: The adjacent, developed Kōloa-Po'ipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kaua'i will increase county-wide by 17,300 residents by 2030. The South Kaua'i population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kaua'i region (the Kōloa - Po'ipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhāʻulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhāʻulepū watershed.

The HDF site is located on the bottom-land of the upper Māhāʻulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Haʻupu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhāʻulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kauaʻi Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhāʻulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhāʻulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhāʻulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The

Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8

inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Poʻipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kauaʻi community.

ALTERNATIVES: As a part of the DEIS, alternatives were evaluated that could attain the objectives of the action's purpose and need, and were compared with environmental benefits, costs, and risks of each reasonable alternative against those of the proposed dairy project. Further discussion of alternatives can be found in DEIS Section 6.

The DEIS evaluates alternatives that could attain the objectives of the action's purpose and need, and compares environmental benefits, costs, and risks of each

reasonable alternative against those of the proposed action. Additionally, reasonable land use alternatives that emerged from public input during the project scoping phase are documented and briefly discussed. The alternatives that do not meet the project purpose are not advanced for analysis of environmental benefits, costs, and risks. The Environmental Impact Statement Rules, Hawaiʻi Administrative Rules Chapter 11-200 (HRS 11-200) requires a discussion of alternatives that could attain the objectives of the action, regardless of cost. There is no requirement for the alternatives analysis to consider every possible land use.

Four possible land uses that would not meet the project purpose are discussed. Rezoning the land for resort or residential development, or a potential conservation condemnation are two uses that were examined and eliminated from analysis. These options would not be reasonably viable given the existing private land tenure and existing zoning. Two additional alternatives were considered as reasonable land uses as they could be permitted within the existing State Land Use Agricultural District and County Agricultural Zoning District. These options include Agricultural Park with Processing Center, and development of an Agricultural Subdivision. The alternatives were examined and eliminated from further analysis, however, as they would not fulfill the project purpose.

The analysis, therefore, focuses on alternatives that meet the project purpose. Rigorous exploration and evaluation of the environmental impacts of the alternatives, including those that might enhance environmental quality or avoid, reduce or minimize some or all of the adverse environmental effects, costs and risks. These alternatives include: (1) the development of a Conventional Feedlot Dairy (a non-pasture-based dairy) at the same location; (2) development of the Pasture-Based Dairy at an Alternative Location on Kauaʻi; and (3) milk products processing by HDF. The alternative of "No Action" is also evaluated.

The alternatives analysis provides a comprehensive evaluation of the range of potential alternatives, including the two alternative development scenarios. Although the alternatives are potentially reasonable uses under existing zoning and neighboring uses, each fails to comprehensively fulfill the project requirements defined by the eight Project Objectives and the four established Evaluation Criteria (Chapter 2, Sections 2.3.3 and 2.3.4).

The essential differences as compared to the proposed action are highlighted in the following statements.

- Only one of the alternative actions (conventional feedlot alternative) would create a commercial scale dairy operation in Hawaiʻi, with the capability to produce 10 percent of the State's fresh milk demand thus reducing dependence on imported milk (Objective 1). This alternative, however, would not reduce reliance on costly imported fertilizer and feed (Objective 2); grow local, quality grass as a primary feedstock (Objective 3); and would not utilize 100 percent of manure on site as nutrients to grow forage for dairy cows (Criterion 4).
- None of the alternatives would secure a dairy location that meets the requirements for a pastoral, pasture-based grazing dairy: sufficient

contiguous land area; available long-term land tenure; adequate potable water supply; suitable soil properties; gentle slope conditions; and accessibility (Criterion 1).

- One alternative (Agricultural Park) could potentially generate new long-term employment in the agricultural sector on Kaua'i in a wide range of positions including pasture agronomy/soils science, environmental resources management (Criterion 2).
- The Agricultural Park alternative could also develop sustainable food production utilizing Important Agricultural Lands, demonstrating the importance of long-term agricultural leases and capital investment for agricultural infrastructure, water systems and support facilities. (Criterion 3). However, after years of trying, it appears there was limited interest in such a venture.
- Finally, addressing the range of potential environmental impacts (natural, cultural, social and economic) (Objective 8) the two alternative development scenarios would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.

In contrast to the other options considered, the planned agricultural operation of Hawai'i Dairy Farms, was determined to be the most viable option and is the preferred alternative. Of all the alternatives considered, this is the only approach that achieves project objectives and meets each of the four Evaluation Criteria.

- Hawai'i Dairy Farms will create a commercial scale pasture-based dairy operation in Hawai'i, with the capability to provide more than 1,000,000 gallons of the fresh milk demand, reducing dependence on imported milk (Objective 1).
- The planned dairy location meets the requirements of minimum land area, soil properties, slope conditions, water supply, land tenure and availability, and accessibility (Criterion 1).
- The planned action will generate new long-term employment in the agricultural sector on Kaua'i, including pasture agronomy/soils science, veterinary and animal husbandry, environmental resources management, milk/milk processing, and dairy business management (Criterion 2).
- Sustainable food production utilizing Important Agricultural Lands (Criterion 3) will occur with the proposed action, demonstrating the importance of long term agricultural leases, and the ability to draw capital investment for agricultural infrastructure including water systems and support facilities (Criterion 3).
- Address the range of potential environmental impacts by utilizing 100 percent of manure as natural fertilizer to grow the majority of food for cows (Criterion 4). The alternatives evaluated would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.
- Creating an economically viable pasture rotational-grazing model maintains agriculture, retains open space, and provides buffer between highly utilized resort and residential development and sensitive natural or cultural resources (Objective 8).

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

From: Michael Diamant <mdmd@hawaiian.net>
Sent: Wednesday, February 18, 2015 4:00 PM
To: HDF
Subject: Kauai Dairy EIS

To Whom It May Concern-

It should be obvious that a dairy will have significant impact on the environment and human health, unless many, many safe guards are put into place in advance and protocols for monitoring. Of note, what happens to all the bovine excrement? How is it treated or is it treated so as not to contaminate ground water and our oceans? How does a dairy alter the environment and what can be done to insure that the environment is not altered? Who monitors this? And lastly, what is the effect on humans? A dairy will attract flys and other insects, which can carry disease. What safe guards will be put in place to help guarantee that the impact on humans is non-existent?

Michael Diamant, MD
Kalaheo, Hawaii

GROUP 70 INTERNATIONAL

May 26, 2016

Michael Diamant
mdmd@hawaiian.net

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Michael Diamant:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

DAIRY OPERATIONS: Hawai'i Dairy Farms (HDF) will establish and operate a sustainable, pastoral rotational-grazing dairy farm in Māhā'ulepū Valley on the island of Kaua'i to produce fresh, locally available nutritious milk for Hawai'i families. The rotational-grazing method utilizes 100 percent of the cows' manure as natural fertilizer to grow pasture grass as a primary source of nutrition for dairy cows. This cost-effective method will reduce reliance on imported fertilizer and feed. Pasture grass will comprise at least 70 percent of the animals' diet. As a part of the Draft Environmental Impact Statement (EIS), the proposed facilities and operations for the dairy farm are described in Chapter 3.

The Environmental Impact Statement (EIS) Preparation Notice (EISPN), published January 23, 2015, described the proposed pasture-based rotational grazing system as a "zero-discharge, grass-fed dairy". The term "zero-discharge" under the U.S. Environmental Protection Agency related to concentrated feeding operations

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(CAFO) is a system designed to not discharge pollutants into waters of the United States. As noted previously, the HDF system is designed to utilize 100 percent of the cows' manure on-site. However, nutrients would be introduced to the HDF site with any use; the Draft EIS identifies the amount of nutrients anticipated from the proposed dairy operations that could pass through to ground and surface waters. Therefore, HDF elected to discontinue use of the term "zero discharge" as it was construed as no nutrients into the system.

The term "grass-fed" was used in the HDF EISPN. This term was used to identify HDF's intent to utilize a locally-produced feedstock – grass – for more than 70 percent of the dairy herds' diet. In January 2016, the U.S. Department of Agricultural (USDA) Marketing Survey created a narrow legal definition of "grass-fed". The USDA standard defines what animals can and cannot be fed. The Food Alliance, a project of several northwest colleges, believes that when consumers choose grass-fed products there is an expectation that these will come from animals raised on pasture on a forage-based diet. Due to the evolving definition of "grass-fed", the term in not used in this EIS.

The dairy facilities will occupy an area of approximately 10 acres on the western boundary of the site. The developed area "footprint" will be less than 2 percent of the total farm area. Four buildings will be constructed to serve different functions, supported by utilities and infrastructure. Additional building information can be found in Draft EIS Section 3.3.1.

Agricultural infrastructure and utilities required for the dairy operations will include storage tanks and silos, effluent storage ponds, livestock water systems, and drainage improvements. The irrigation system and distribution of livestock water are discussed in Draft EIS Section 3.5, Pasture Management.

The pastoral rotational-grazing dairy provides a local feedstock – grass – as the herd's primary food source. Reducing imported feed stabilizes costs and provides a food source closer to the natural diet of cows. Results of grass trials initially conducted at five sites across four Hawaiian Islands were instrumental in identifying appropriate varieties of grass, and suitable sites to support sufficient "dry matter" grass yields essential to a cow's diet. Additional project-specific trials at the Māhāʻulepū site on Kauai have been conducted for more than 18 months. The results have identified sufficient yield and nutrition to supply 70 percent of the cows' diet; improvements in grass productivity are anticipated to provide up to 85 percent of cows' diet.

The pasture-based model allows cows to move about freely, and to lie down and rest, which is part of the digestion cycle. The animals are managed in social groups known as "mobs", mimicking the natural social order of bovines. Cows spend 22 hours of each 24-hour period foraging on pasture or resting, outdoors in natural light and fresh air. The gently sloped paddocks, walkways and races minimize the energy expended by the mature dairy cows as they graze or are transferred to and from the various paddocks and the mature dairy facility; surfaces of the walkways and cow races are designed to provide a comfortable path under hoof. The management practices and pasture model applied by HDF maximizes grass as the

cows' primary nutrition source and minimizes stress to the animals. Cows tend to be healthier and live longer, productive lives with access to fresh air, high quality feed, and exercise while they forage.

The 470 acres of pasture will be divided into paddocks averaging 3 to 5 acres in size. Smaller paddocks located near the dairy facility will be used as temporary pasture for cows or calves being moved on or off the farm. To protect the water quality of surface water and downstream areas, paddock fences are set back 35 feet from the edge of drainage ways throughout the site. Existing vegetation within the setbacks will be managed or restored to reduce erosion, improve stability of ditch banks, increase net carbon storage, and improve and maintain water quality.

The majority of the pastures will be irrigated with non-potable water and/or diluted effluent through either the pivot irrigation systems or through gun irrigators. Irrigation water supply is provided to the farm from Waita Reservoir, and will be filtered and pumped to the various irrigation components on the farm. The irrigation system is controlled using computer software and GPS receivers to allow very precise application of irrigation and/or diluted effluent on the pasture. The pivots can rotate and apply irrigation water and/or diluted effluent at different rates depending on the actual irrigation needs of the farm.

NRCS provides technical guidance on applying agricultural waste depending on the desired use of the waste. Reflected in the title of the livestock waste guidance for Hawaiʻi is the parenthetical inclusion of the word "nutrients." Where waste is utilized as a resource, it is being used for the constituent components that provide benefit.

The NRCS Conservation Practice Standard 590, Nutrient Management, applies to commercial fertilizers, organic by-products, waste water, organic matter, and irrigation water. Nutrient management is the practice of managing the amount, rate, source, method of application, and timing of plant nutrients and soil amendments. The timing and application of nutrients will correspond with plant uptake, soil properties and weather conditions. For more information on nutrient balance management see Draft EIS Section 3.5.3, and Draft EIS Appendix D.

The effluent storage ponds are sized to accommodate 30 days of storage for up to 2,000 mature dairy cows, and over 85 days of storage for 699 mature dairy cows. It will be highly unlikely that the storage pond will be full at any time for the contemplated 2,000-cow dairy, and nearly impossible for the committed 699-cow dairy. Throughout the less than 30-day storage period, effluent is planned for application every four days, and the slurry application is expected at least once every 45 days, to ensure that the ponds are kept at manageable levels.

Cows lactate milk following the birth of calves. Newborn calves will be housed on the Māhāʻulepū site and provided essential colostrum and nutrients for a healthy start. During the calves' initial 90 days, they will be transitioned to pasture at HDF before transfer to ranches on Kauaʻi to be raised off-site. The committed herd size of 699 mature dairy cows at the Māhāʻulepū site applies to mature mature dairy cows. Animals in various stages of lactation and rest will be transferred between HDF and

other partner ranches as needed for animal health and dairy productivity. This will benefit both the dairy and infuse the beef market in Hawai'i with a new, local source of pasture-raised calves. Male calves will become part of the beef cattle herd; heifers (young female calves that haven't given birth) will be raised until ready to return to the HDF herd as a birthing/mature dairy cow. For more information on off-site herd management, refer to Section 3.7 of the Draft EIS.

Health of the herd is of primary importance as the success of a dairy relies on cows effectively producing quality milk. All cows will be treated with a high standard of care. Dairy managers and caretakers will be trained and competent in handling animals to minimize stress and ensure the herds' welfare. A licensed veterinarian may prescribe use of antibiotics approved by the Food & Drug Administration (FDA) for treatment of illnesses. Adherence to guidelines that prohibit milk from cows undergoing antibiotic treatment will ensure no adulteration of milk. Routine laboratory tests of milk for traces of antibiotic residue will be conducted. HDF will not inject cows with bovine growth hormone, referred to as rBST or rBGH.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhā'ulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhā'ulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Po'ipū region is on the order of 201 – 500 feet per day.

Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhā'ulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawai'i Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhā'ulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhā'ulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhā'ulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kaua'i community.

Regional Water Demand: The adjacent, developed Kōloa-Po'ipū region shows large and increasing demand for potable water for community and resort development.

The State Department of Economic Development and Tourism (DBEDT) projects the population of Kaua'i will increase county-wide by 17,300 residents by 2030. The South Kaua'i population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kaua'i region (the Kōloa - Po'ipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhā'ulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhā'ulepū watershed.

The HDF site is located on the bottom-land of the upper Māhā'ulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Ha'upu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhā'ulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kaua'i Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhā'ulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhā'ulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhā'ulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the

current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

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The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

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monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kauaʻi community.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawaiʻi Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

From: Jay Dorrance [mailto:darwinbeag@yahoo.com]
Sent: Monday, February 23, 2015 5:07 PM
To: EPO
Subject: letter -My public Comment regarding Hawaii Dairy Farm EIS

Hawaii Dept. of Health

Jay Dorrance
P.O box 510141
Kealia Hi
96751

Dear Sir or Madam,

I personally feel like the proposed planned dairy for Maha'ulepu is an unsafe, overreaching plan that should be put on hold at this time until an independently contracted EIS can be done. I believe that the concentrated rotational dairy proposed by HDF is far too much waste to add safely to the area in question.

Soil testing needs to be taken seriously, with the long-term effects of grazing management systems and their impacts on soil quality and water quality in local wells preeminent.

A Voluntary "EIS" is a travesty to those concerned with the long-term viability of Kauai's Tourism in the Poipu area. A large, high-density dairy is not what was likely envisioned for Mahalepu's agricultural zoning and is also extremely close to residential zoning.

Kauai can support good neighbor business when care for local resources and not just a profits first mentality is part of the mission statement.

Kauai has supported small dairies in the past with the largest herd of less than 500. These dairies were located in more rural locations with herds rotated to different pastures. The proposed dairy in Mahalepu is a completely different practice and will have much more concentrated effect on the pasture land in question.

Kauai will change with the times however it is all our concern as people of Kauai to steward a future that balances new opportunities without losing others or perhaps creating insolvable problems.

I am disappointed that our Department of Health is not taking part in this EIS.

Jay Dorrance

Kapaa, Kauai

Jay Dorrance

GROUP 70 INTERNATIONAL

May 26, 2016

Jay Dorrance
P.O. Box 510141
Kealia, HI 96751
darwinbeag@yahoo.com

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Jay Dorrance:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

Your comments were received by the State of Hawai'i Department of Health Environmental Planning office. The Department of Health forwarded a copy of your comments to Group 70 International in order to be included in the Draft Environmental Impact Statement (EIS) analysis. This letter was prepared in response to your comments.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

GROUP 70 OBJECTIVITY: Group 70 International, Inc. (Group 70) is responsible for the preparation and processing of the Hawai'i Dairy Farms Environmental Impact Statement (EIS). The EIS was prepared in accordance with the requirements of Chapter 343 Hawai'i Revised Statutes and the "Environmental Impact Statement Rules" (Chapter 200 of Title 11, Hawai'i Administrative Rules). The environmental

planning team at Group 70 has prepared several hundred Environmental Assessment and EIS documents over the past 40 years, and every document has been accepted by the responsible County, State and Federal agency. On numerous past EIS projects, the Hawai'i Chapter of the American Planning Association has recognized Group 70's professional work with Chapter awards for excellence in environmental planning. Part of the EIS scoping process involves Group 70's experienced team of technical sub consultants that are well-known and qualified in their respective fields of study. For this project, Group 70 is preparing the Hawai'i Dairy Farms EIS with the level of analysis required to properly evaluate and disclose the existing environmental conditions, probable impacts with mitigation, and potential cumulative and secondary effects.

DAIRY OPERATIONS: Hawai'i Dairy Farms (HDF) will establish and operate a sustainable, pastoral rotational-grazing dairy farm in Māhā'ulepū Valley on the island of Kaua'i to produce fresh, locally available nutritious milk for Hawai'i families. The rotational-grazing method utilizes 100 percent of the cows' manure as natural fertilizer to grow pasture grass as a primary source of nutrition for dairy cows. This cost-effective method will reduce reliance on imported fertilizer and feed. Pasture grass will comprise at least 70 percent of the animals' diet. As a part of the Draft Environmental Impact Statement (EIS), the proposed facilities and operations for the dairy farm are described in Chapter 3.

The Environmental Impact Statement (EIS) Preparation Notice (EISPN), published January 23, 2015, described the proposed pasture-based rotational grazing system as a "zero-discharge, grass-fed dairy". The term "zero-discharge" under the U.S. Environmental Protection Agency related to concentrated feeding operations (CAFO) is a system designed to not discharge pollutants into waters of the United States. As noted previously, the HDF system is designed to utilize 100 percent of the cows' manure on-site. However, nutrients would be introduced to the HDF site with any use; the Draft EIS identifies the amount of nutrients anticipated from the proposed dairy operations that could pass through to ground and surface waters. Therefore, HDF elected to discontinue use of the term "zero discharge" as it was construed as no nutrients into the system.

The term "grass-fed" was used in the HDF EISPN. This term was used to identify HDF's intent to utilize a locally-produced feedstock – grass – for more than 70 percent of the dairy herds' diet. In January 2016, the U.S. Department of Agricultural (USDA) Marketing Survey created a narrow legal definition of "grass-fed". The USDA standard defines what animals can and cannot be fed. The Food Alliance, a project of several northwest colleges, believes that when consumers choose grass-fed products there is an expectation that these will come from animals raised on pasture on a forage-based diet. Due to the evolving definition of "grass-fed", the term in not used in this EIS.

The dairy facilities will occupy an area of approximately 10 acres on the western boundary of the site. The developed area "footprint" will be less than 2 percent of the total farm area. Four buildings will be constructed to serve different functions,

supported by utilities and infrastructure. Additional building information can be found in Draft EIS Section 3.3.1.

Agricultural infrastructure and utilities required for the dairy operations will include storage tanks and silos, effluent storage ponds, livestock water systems, and drainage improvements. The irrigation system and distribution of livestock water are discussed in Draft EIS Section 3.5, Pasture Management.

The pastoral rotational-grazing dairy provides a local feedstock – grass – as the herd's primary food source. Reducing imported feed stabilizes costs and provides a food source closer to the natural diet of cows. Results of grass trials initially conducted at five sites across four Hawaiian Islands were instrumental in identifying appropriate varieties of grass, and suitable sites to support sufficient "dry matter" grass yields essential to a cow's diet. Additional project-specific trials at the Māhā'ulepū site on Kauai have been conducted for more than 18 months. The results have identified sufficient yield and nutrition to supply 70 percent of the cows' diet; improvements in grass productivity are anticipated to provide up to 85 percent of cows' diet.

The pasture-based model allows cows to move about freely, and to lie down and rest, which is part of the digestion cycle. The animals are managed in social groups known as "mobs", mimicking the natural social order of bovines. Cows spend 22 hours of each 24-hour period foraging on pasture or resting, outdoors in natural light and fresh air. The gently sloped paddocks, walkways and races minimize the energy expended by the mature dairy cows as they graze or are transferred to and from the various paddocks and the mature dairy facility; surfaces of the walkways and cow races are designed to provide a comfortable path under hoof. The management practices and pasture model applied by HDF maximizes grass as the cows' primary nutrition source and minimizes stress to the animals. Cows tend to be healthier and live longer, productive lives with access to fresh air, high quality feed, and exercise while they forage.

The 470 acres of pasture will be divided into paddocks averaging 3 to 5 acres in size. Smaller paddocks located near the dairy facility will be used as temporary pasture for cows or calves being moved on or off the farm. To protect the water quality of surface water and downstream areas, paddock fences are set back 35 feet from the edge of drainage ways throughout the site. Existing vegetation within the setbacks will be managed or restored to reduce erosion, improve stability of ditch banks, increase net carbon storage, and improve and maintain water quality.

The majority of the pastures will be irrigated with non-potable water and/or diluted effluent through either the pivot irrigation systems or through gun irrigators. Irrigation water supply is provided to the farm from Waita Reservoir, and will be filtered and pumped to the various irrigation components on the farm. The irrigation system is controlled using computer software and GPS receivers to allow very precise application of irrigation and/or diluted effluent on the pasture. The pivots can rotate and apply irrigation water and/or diluted effluent at different rates depending on the actual irrigation needs of the farm.

NRCS provides technical guidance on applying agricultural waste depending on the desired use of the waste. Reflected in the title of the livestock waste guidance for Hawai'i is the parenthetical inclusion of the word "nutrients." Where waste is utilized as a resource, it is being used for the constituent components that provide benefit.

The NRCS Conservation Practice Standard 590, Nutrient Management, applies to commercial fertilizers, organic by-products, waste water, organic matter, and irrigation water. Nutrient management is the practice of managing the amount, rate, source, method of application, and timing of plant nutrients and soil amendments. The timing and application of nutrients will correspond with plant uptake, soil properties and weather conditions. For more information on nutrient balance management see Draft EIS Section 3.5.3, and Draft EIS Appendix D.

The effluent storage ponds are sized to accommodate 30 days of storage for up to 2,000 mature dairy cows, and over 85 days of storage for 699 mature dairy cows. It will be highly unlikely that the storage pond will be full at any time for the contemplated 2,000-cow dairy, and nearly impossible for the committed 699-cow dairy. Throughout the less than 30-day storage period, effluent is planned for application every four days, and the slurry application is expected at least once every 45 days, to ensure that the ponds are kept at manageable levels.

Cows lactate milk following the birth of calves. Newborn calves will be housed on the Māhā'ulepū site and provided essential colostrum and nutrients for a healthy start. During the calves' initial 90 days, they will be transitioned to pasture at HDF before transfer to ranches on Kaua'i to be raised off-site. The committed herd size of 699 mature dairy cows at the Māhā'ulepū site applies to mature mature dairy cows. Animals in various stages of lactation and rest will be transferred between HDF and other partner ranches as needed for animal health and dairy productivity. This will benefit both the dairy and infuse the beef market in Hawai'i with a new, local source of pasture-raised calves. Male calves will become part of the beef cattle herd; heifers (young female calves that haven't given birth) will be raised until ready to return to the HDF herd as a birthing/mature dairy cow. For more information on off-site herd management, refer to Section 3.7 of the Draft EIS.

Health of the herd is of primary importance as the success of a dairy relies on cows effectively producing quality milk. All cows will be treated with a high standard of care. Dairy managers and caretakers will be trained and competent in handling animals to minimize stress and ensure the herds' welfare. A licensed veterinarian may prescribe use of antibiotics approved by the Food & Drug Administration (FDA) for treatment of illnesses. Adherence to guidelines that prohibit milk from cows undergoing antibiotic treatment will ensure no adulteration of milk. Routine laboratory tests of milk for traces of antibiotic residue will be conducted. HDF will not inject cows with bovine growth hormone, referred to as rBST or rBGH.

SOILS: Soil is an ecosystem that can be managed to provide nutrients for plant growth, to absorb and hold rainwater for use during dryer periods, to filter and buffer potential pollutants from leaving fields, to serve as a firm foundation for agricultural activities, and to provide habitat for soil microbes to flourish and

diversify to keep the ecosystem healthy. Two rounds of independent soil sampling were undertaken at HDF to understand and characterize available soil nutrients and conditions. Section 4.3 of the Environmental Impact Statement (EIS) characterizes soil conditions, and anticipated impacts from effluent and supplemental nutrient application. Recommendations from Dr. Russell Yost and Nicholas Krueger of the University of Hawai'i at Mānoa are summarized. Their baseline nutrient report is included as Appendix C of the Draft EIS.

Soil conservation is a core principal behind establishment of the NRCS, which was formed out of the Soil Conservation Service to acknowledge its expanded role in watershed-scale approach using science-based tools and standards in agronomy, engineering economics, wildlife biology and other disciplines to aid landowners in implementation of conservation practices. NRCS conservation practices are listed in Chapter 3, Section 3.2; these practices codes identify design and construction standards related to drainage, materials, operations and applicable engineering standards. HDF will follow the developed Conservation Plan, which was approved by the West Kaua'i Soil & Water Conservation District in December, 2013.

The United States Department of Agriculture (USDA) Natural Resources Conservation Services (NRCS) has mapped and classified soils for more than 95 percent of the United States. Comments received during the initial scoping for this EIS included a "Custom Soils Resource Report for Island of Kaua'i, Hawai'i." The report was generated from the USDA NRCS website, which allows any internet user to define an area of interest, customize data results, and generate a Custom Soil Resource Report. The user can select or deselect parameters based upon which data the user would like to display. These user-generated reports are not evaluated by NRCS.

The NRCS soils classifications and descriptions provide a good information base, however, in-field soils testing is needed to identify existing soil nutrient levels and conditions. The most abundant soil types at the HDF site are Kalihi Clay at 32 percent, Ka'ena Clay Brown Variant at 29 percent, and Lualualei Clay at roughly 14 percent of the dairy site. Laboratory analysis of soil samples collected in 2014 identified levels of pH, phosphorus, nitrogen, potassium, calcium, magnesium, organic matter, salinity, micronutrients and other constituents. The results illustrate that the soils are depleted of nutrients, which is typical for lands formerly used for sugarcane. The soil nutrient status and fertility demands of the primary crop, Kikuyu grass, were used to identify the quantities of nutrients required for productive grass growth. The soils data provide a baseline to guide adaptive nutrient management throughout establishment and maturity of the dairy.

A second round of field sampling was conducted in 2015, and focused on evaluation of soils characterized as "poorly drained", and established a quantitative baseline of soil salinity and sodicity to provide for future monitoring of soil health with application of manure effluent. Laboratory analysis determined electrical conductivity and exchangeable sodium percentage, in addition to nutrient levels of nitrogen phosphorus calcium, magnesium, and potassium.

Poorly drained is not an indication of low or poor infiltration. Infiltration refers to the ability of water to enter the soil surface, whereas "drainage" refers to the movement of water within or from the soil profile. Poorly drained soils typically have low hydraulic conductivity, or a slow rate of groundwater movement through the soil. This slow movement can create anaerobic conditions, which typically result in higher rates of denitrification. This is the conversion of potentially nitrates and nitrites to gaseous forms, which reduces the potential for impacts on waterbodies. In this way, "poorly drained" soils may represent less risk of nitrate and nitrite leaching to associated waterbodies than "well drained" soils (Yost, 2016).

As a result of reduced movement of water through the soil profile, the mobility of nutrients such as potassium and phosphorus is also reduced. Soil types at the HDF site are known to adsorb and retain large amounts of phosphorus. Under the NRCS phosphorus leaching index for Hawai'i soils, HDF soils show low risk for leaching. With low risk, phosphorus can be applied at rates greater than crop requirements if manure or other organic materials are used to supply nutrients.

The dairy's focus on robust and healthy grass growth will build organic matter in soils through use of manure as a natural fertilizer. Soil can incorporate carbon from the atmosphere, which benefits soil health. According to recent studies in the Soil Science Society of America Journal, the conversion of formerly tilled cropland to grazed pasture can drive substantial accumulation of organic carbons in soil, with a potential to offset up to one-third of the annual increase in atmospheric carbon dioxide. The potential soil organic matter and carbon dioxide sequestration benefits are likely greatest in highly degraded soils in warm subtropical climates, partly due to long pasture-growing seasons. Long-term soil impacts are anticipated to result in improvement to the physical, chemical, and biological condition of the soil.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

February 20, 2015

Mr. Jeff Overton
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, HI 96813

Dear Mr. Overton,

My family has lived in Koloa, Hawaii for decades. We swam at Poipu beaches and often frequent the area to dine or for recreation. It's home; a bastion of peace, safety and comfort. The proposed dairy in Maha'ulepu, as we see it, will completely destroy life on the South Side and beyond as we now know it.

Four wells that serve as sources of public drinking water for Koloa and Poipu are close to the area of the dairy designated to receive pumped manure sludge when draining the effluent ponds. Scientists specializing in agricultural operations have issued a dire warning: The risk of water CONTAMINATION from migrating bacteria and nitrates would be great. This translates into not only exposing South Side residents to contaminated drinking water but also the thousands of visitors who arrive annually and infuse the economy with millions of dollars.

A herd of 2,000 dairy cows (Phase II) will produce millions of pounds of manure monthly. HDF's plans claim zero waste elimination but the NRCS's June 2014 study, "Custom Soil Resource Report", concludes that the soil on this site is "very limited" in its ability to absorb animal waste and risk of runoff is "high" or "very high". Millions of pounds of runoff flowing into the ocean waters of the South Shore - a monumental environmental and economic disaster in the making for the entire South Shore. HDF's plan calls for the creation of 10 - 15 new jobs. And what of the thousands who will lose jobs as we watch the demise of the hotel and visitor industry and other related businesses - restaurants, those engaged in water sports, sightseeing, etc.?

Entomologists have stated that the dairy will spawn billions of flies within months - the biting variety with cerrated mouths that live on blood - and they will inhabit a radius of five miles. What plans does HDF have in place to address this serious health threatening situation?

Maha'ulepu's spectacular landscape is home to endangered species, irreplaceable natural, cultural, historic, agricultural and scientific resources - petroglyphs, a heiau and unexcavated sites are amongst the treasures to be found in the area. Surely we owe it to the Native Hawaiians to honor all that is sacred to them. In honoring them, we preserve for ourselves that which is irreplaceable. Endangering or destroying these sites would be an unconscionable act.

It has been estimated that homes located near dairies can lose up to 88% of their value depending on proximity and whether they're upwind or downwind of the operation and the number of days per month when there's an odor. That many work at two to three jobs to meet mortgage payments is no secret; plummeting values of our homes is a nightmare we should never have to face. I wonder what buyer would jump at the following ad: House for sale in South Side, prime location downwind from large dairy, polluted drinking water, scent of eau de cow manure wafting through air, property infested with biting flies, all conditions pose significant health threats.

The dairy will require millions of gallons of water daily for its operations. What entitles this proposed operation to draw from Waita Reservoir, a resource that is meant for residents?

Hurricane season brings fearsome weather conditions and the dairy site will not be spared. We have yet to hear of contingency plans for dealing with the animals, the effluent ponds, etc. when storms bring driving rains and winds.

To State officials: The Hawaii State Constitution, Article 11, Section 1, directs government officials to "conserve and protect Hawaii's natural beauty and all natural resources" for current and future residents. If ever there was a time that you were being called upon to fulfill your obligation to protect the land and its people, it's NOW. A study of the facts and potential risks will lead you to an inevitable conclusion: HDF's dairy will result in one of the largest environmental, cultural, historical, social, health and economic disasters in Hawaii's history. Any conclusion to the contrary would be one based on denial of the facts.

Sincerely,

Ellen R. Ebata

GROUP 70 INTERNATIONAL

May 26, 2016

Ellen Ebata
P.O. Box 1226
Koloa, HI 96756-1226

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Ellen Ebata:

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Group 70 International • 925 Bethel Street, 5th Floor • Honolulu, HI 96813-4307 • tel. 808.523.5866 • fax. 808.523.5874 • www.group70int.com

Environmental Protection Agency related to concentrated feeding operations (CAFO) is a system designed to not discharge pollutants into waters of the United States. As noted previously, the HDF system is designed to utilize 100 percent of the cows' manure on-site. However, nutrients would be introduced to the HDF site with any use; the Draft EIS identifies the amount of nutrients anticipated from the proposed dairy operations that could pass through to ground and surface waters. Therefore, HDF elected to discontinue use of the term "zero discharge" as it was construed as no nutrients into the system.

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The dairy facilities will occupy an area of approximately 10 acres on the western boundary of the site. The developed area "footprint" will be less than 2 percent of the total farm area. Four buildings will be constructed to serve different functions, supported by utilities and infrastructure. Additional building information can be found in Draft EIS Section 3.3.1.

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SOILS: Soil is an ecosystem that can be managed to provide nutrients for plant growth, to absorb and hold rainwater for use during dryer periods, to filter and buffer potential pollutants from leaving fields, to serve as a firm foundation for agricultural activities, and to provide habitat for soil microbes to flourish and diversify to keep the ecosystem healthy. Two rounds of independent soil sampling were undertaken at HDF to understand and characterize available soil nutrients and conditions. Section 4.3 of the Environmental Impact Statement (EIS) characterizes soil conditions, and anticipated impacts from effluent and supplemental nutrient application. Recommendations from Dr. Russell Yost and Nicholas Krueger of the University of Hawai'i at Mānoa are summarized. Their baseline nutrient report is included as Appendix C of the Draft EIS.

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A second round of field sampling was conducted in 2015, and focused on evaluation of soils characterized as "poorly drained", and established a quantitative baseline of soil salinity and sodicity to provide for future monitoring of soil health with application of manure effluent. Laboratory analysis determined electrical conductivity and exchangeable sodium percentage, in addition to nutrient levels of nitrogen phosphorus calcium, magnesium, and potassium.

Poorly drained is not an indication of low or poor infiltration. Infiltration refers to the ability of water to enter the soil surface, whereas "drainage" refers to the movement of water within or from the soil profile. Poorly drained soils typically have low hydraulic conductivity, or a slow rate of groundwater movement through the soil. This slow movement can create anaerobic conditions, which typically result in higher rates of denitrification. This is the conversion of potentially nitrates and nitrites to gaseous forms, which reduces the potential for impacts on waterbodies. In this way, "poorly drained" soils may represent less risk of nitrate and nitrite leaching to associated waterbodies than "well drained" soils (Yost, 2016).

As a result of reduced movement of water through the soil profile, the mobility of nutrients such as potassium and phosphorus is also reduced. Soil types at the HDF site are known to adsorb and retain large amounts of phosphorus. Under the NRCS phosphorus leaching index for Hawai'i soils, HDF soils show low risk for leaching. With low risk, phosphorus can be applied at rates greater than crop requirements if manure or other organic materials are used to supply nutrients.

The dairy's focus on robust and healthy grass growth will build organic matter in soils through use of manure as a natural fertilizer. Soil can incorporate carbon from the atmosphere, which benefits soil health. According to recent studies in the Soil Science Society of America Journal, the conversion of formerly tilled cropland to grazed pasture can drive substantial accumulation of organic carbons in soil, with a potential to offset up to one-third of the annual increase in atmospheric carbon dioxide. The potential soil organic matter and carbon dioxide sequestration benefits are likely greatest in highly degraded soils in warm subtropical climates, partly due to long pasture-growing seasons. Long-term soil impacts are anticipated to result in improvement to the physical, chemical, and biological condition of the soil.

NATURAL HAZARDS: The potential impacts of natural hazards are evaluated in the Draft Environmental Impact Statement (EIS), including flooding, tsunami, earthquakes, and hurricanes. Draft EIS Section 4.6 addresses natural hazards.

The Māhāʻulepū property is not known to experience flooding conditions. The area is located within Federal Emergency Management Agency (FEMA) Zone X, areas determined to be outside the 0.2% annual chance floodplain. The proposed location for Hawaiʻi Dairy Farms (HDF) lies between the 60 and 150 feet elevation, outside the tsunami evacuation zone. The Kauaʻi and Niʻihau region of the Hawaiian Islands has experienced tremors from earthquakes originating further south in the island chain, but no known seismic activity has originated among these northern islands.

Although they occur infrequently, Kauaʻi has received a greater amount of damage from hurricanes when compared to the other Hawaiian Islands. Land management personnel in the Māhāʻulepū region during and following the hurricanes that affected Kauaʻi in 1982 and 1992 observed defoliation of vegetation, and no flooding events in the period following passage of the storms.

Preparedness is the best protection for natural disasters. Structural design of dairy facilities will meet International Building Code (IBC) 2006 standards with local amendments. Provisions in design will address wind loading (including hurricane gusts), rain and flood loading, and earthquake loading. A geotechnical evaluation of the area recommended Seismic Site Class D under IBC standards be utilized for foundation design where the barns and agricultural infrastructure will be constructed.

There has been no rainfall event that would exceed the capacity of the effluent ponds since rainfall has been recorded in Māhāʻulepū Valley. The effluent pond capacity has been designed above the regulatory requirement to contain the 25-year, 24-hour rainfall event. An emergency containment berm with additional capacity for another 30 days is included in the design. This design exceeds regulatory requirements, with containment in excess of the major rainfall events recorded on Kauaʻi over the past three decades.

An emergency preparedness plan for protection of animals has been prepared for HDF internal use that addresses hurricane, fire, and potential flooding hazard scenarios. HDF is not in a tsunami inundation area, so this scenario is not planned for in the disaster plan. The disaster plan relies upon knowledge of cow behavior, and is based on extensive guidance for livestock protection from NRCS, the Florida State Agricultural Response Team (SART), Pennsylvania State College of Agricultural Sciences, and Cornell University Cooperative Extension. The plan includes safety procedures during any disaster, follow up actions, and emergency contacts for assistance before, during or following the event. Further information is provided in the Draft EIS Section 4.6.2.

ARCHAEOLOGICAL AND CULTURAL: The Hawaiʻi Dairy Farms (HDF) project is subject to a historic preservation review by the State Department of Land and Natural Resources, State Historic Preservation Division (SHPD) under HRS Chapter 6E and Chapter 13-284. An Archaeological Inventory Survey (AIS) and a Cultural

Impact Assessment (CIA) were conducted by Scientific Consultant Services (SCS) for the proposed project. EIS Sections 4.7 and 4.8 provide an evaluation of archaeology and cultural resources, with technical studies in Appendix G and H.

A total of sixteen historic properties were identified through a pedestrian survey of the project area and an extended survey area of 100 meters of the northern boundary. Six historic-era sites occur in the project area and 10 sites occur in the extended survey area. Only one of the sites is believed to be associated with pre-Contact and/or early historic times. State Site 50-30-10-2250, the agricultural heiau, and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area. The remaining sites consist of historic-era bridges, ditches, culverts, retaining walls, and a flume system dating from the 20th century and are affiliated with sugarcane cultivation.

That a majority of the documented sites are related to the historic-era is not surprising, given the massive landscape modifications that occurred during intensive sugarcane cultivation on the valley floor. Even historic era cultural materials associated with the many Land Commission Awards in the project area were non-existent, as explored through survey and subsurface exploration.

The sixteen historic properties have been assessed for significance by the archaeological consultant and the dairy project is anticipated to have no impact on these sites. No further archaeological work is recommended for the sites. Two of the sixteen sites are considered significant under multiple criteria, but occur outside the project area on lands owned by a different landowner. Both sites will not be adversely affected by the proposed dairy project. No site is related to burials, and no bonex were found. Such sites have been reported along coastal areas in sand dunes.

The cultural assessment examined the potential effect of the project on cultural resources, practices or beliefs, its potential to isolate cultural resources, practices or beliefs from their setting, and the potential of the project to introduce elements which may alter the setting in which cultural practices take place. Information received from the community indicates the Māhāʻulepū Ahupuaʻa, has been and is currently used for traditional cultural purposes. However, the dairy project area has not been included in these activities. It is clear that the gathered plants, trails, State Site 50-30-10-2250, the agricultural heiau, and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area.

The project will be fully enclosed by perimeter fencing along the boundary of the leased premises, which will ensure that project activities and any related impacts are contained within the project area. Based on the research and comments received from the community, it is reasonable to conclude that, pursuant to Act 50, the exercise of native Hawaiian rights or any ethnic group related to numerous traditional cultural practices will not be impacted by establishment of the dairy.

FLORA AND FAUNA: Botanical, avian, and mammalian surveys of the property were conducted for the Draft Environmental Impact Statement (EIS) to assess existing species on site, including identifying any species listed as endangered, threatened, or proposed under any state or federal endangered species programs in or near the

property. EIS Sections 4.9 and 4.10 address the evaluation of flora and fauna resources, with technical studies in Appendix A and B.

A botanical survey of the dairy property was conducted in August 2014 by AECOS Consulting to assess existing plant species. The survey also investigated for the presence of plants currently listed as endangered, threatened or proposed for listing under Federal or the State of Hawai'i's endangered species programs, located onsite or within the immediate vicinity of the dairy site. The nature of the land and its present and historical uses for intensive agriculture very much limit the natural botanical resources anticipated to occur on this land. Complete species lists are included in the EIS, and no protected botanical species occur on the project property. The project will include vegetated buffer strips along the drainage ways as part of the Conservation Plan to reduce erosion and stabilize slopes. Where native plants occur or could survive if planted, native plants will be used in the stabilization. No long-term impacts to native plant habitats or endangered or threatened plants species will occur as a result of the dairy.

Avian and mammalian surveys were conducted in August 2014 by Rana Biological Consulting, Inc. This survey was conducted to assess the potential presence of avian or mammalian species currently listed as endangered, threatened or proposed for listing under either Federal or the State endangered species lists. The survey covered the dairy site area and immediate vicinity. Common birds and terrestrial mammals were encountered on the property. There is no critical habitat for endangered species in the upper Māhā'ulepū Valley.

Four species of endangered waterbirds were recorded on the site and at the nearby taro farm located within the HDF site. Though the area does not provide critical habitat, seabirds that nest in upland areas of Kauai may overfly the site. The endangered Hawaiian goose, nēnē was also seen on the site. State Division of Forestry and Wildlife biologists have noted nēnē are regularly seen on the subject property. It is probable that some nest on or adjacent to the site as this species nests in the general Kōloa area, and the habitat present on parts of the site is suitable for nēnē nesting.

The principal potential impacts posed to the five endangered species include those potentially associated with construction activities, and those associated with dairy farm operations following build-out. Measures will be adopted to avoid potential seabird and nēnē goose collisions with fences and structures. Potential measures include lowering construction cranes at night, using conservation fencing to project-specified areas, marking tall structures and fencing with white visibility polytape, limiting nighttime lighting, and shading any outside lights used at night. Ongoing mitigation strategies will be implemented for day-to-day preventative measures, including an Avian Species Protection Plan. Mitigation measures are further described in DEIS Section 4.10.2.

It is also likely that Hawaiian hoary bats overfly the project area on a seasonal basis. While caution will be taken during any potential disturbance or vegetation removal, there are almost no suitable roost trees within the dairy site, thus it is expected that the dairy farm will not affect this listed mammalian species.

PESTS: A study of invertebrate species and pest insects was conducted by Steven Lee Montgomery, PhD, Consulting Biologist in January 2016. The study summarizes the presence or absence of native species or pest species associated with cattle manure in the general Māhā'ulepū area, as well as the parasites and predators that control those species. No federally or state listed endangered or threatened invertebrate species were noted in the survey of the site. A full report and list of species found on site is provided in EIS Section 4.11 and Appendix B.

Flies were identified on the HDF site using manure from neighboring livestock as bait for invertebrates. The two flies associated with livestock are the stable fly and the horn fly, the latter known for biting cattle. These flies and the greenbottle fly are often confused with the house fly. Flies known to exist on Kaua'i but not seen at the HDF site include the house fly, the dog dung fly, and the chicken dung fly. These pests are common in areas with high pet populations. It is possible these fly species could inadvertently be brought to the dairy and utilize manure as a food source. HDF will prevent and control fly population growth through diligent clean up and sanitation practices regarding any trash and food waste, as well as through efficient manure composting practices. A full list of site management measures is provided in EIS Section 4.11. The project location does not provide any habitat for *drosophila musaphilia*, the only Kaua'i species of native Hawaiian fly listed as Endangered or Threatened. Native Drosophila habitat is located many miles away in the high elevation koa-'ōhi'a forests.

Fly populations at HDF will be minimized through a process known as Integrated Pest Management (IPM). Essentially, IPM disrupts reproduction with appropriate means at key points in the pest's life cycle. Used in Hawai'i for decades, a number of invertebrates and a bird (the cattle egret) were introduced between 1898 and 1950 to reduce livestock-related insects. IPM utilizes knowledge of the ancient food web among species.

An especially important insect to minimize fly breeding habitat in manure is the dung beetle, which buries manure and incorporates it into the soil. Populations of dung beetles found on Kaua'i and those species already in Māhā'ulepū Valley, will increase with the increased manure food source, thus increasing and speeding breakdown of manure. Dung beetles are specialists in the very important natural process of breaking up and quickly recycling bovine manure pads. The behavioral diversity among dung beetle species will work together to bury dung pats in one to three days, a shorter amount of time than the 10-30 days flies eggs need to hatch.

In the Kōloa-Po'ipū region, pest fly populations are dependent upon food and breeding sources nearby such as dog, cat, and chicken feces. Beef cattle graze in the region on agricultural lands along Ala Kinoiki Road between Kōloa and Po'ipū, and it is likely the livestock-related flies identified at the HDF site occur in this region as well. Localized controls to reduce pest populations need to address breeding sites in and amongst the food and animals wastes within the area. These mitigation measures will make it difficult for flies to breed, and BMPs will be enforced to address any increase in population, therefore it is expected that the dairy farm will not significantly affect recreational and resort areas.

DEMOGRAPHIC AND ECONOMIC: The potential impacts of Hawai'i Dairy Farms (HDF) to the existing economy were evaluated in the Draft Environmental Impact Statement (EIS), including a fiscal impact assessment report completed in April, 2016 by Plasch Economics Pacific. Draft EIS Section 4.15 addresses demographic and economic factors, with the complete report in Appendix J.

The HDF project would create short-term benefits through jobs for local construction personnel and local material suppliers. Such jobs would include equipment operators, cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, supervisors, painters, etc. Based on State employment multipliers, indirect employment related to Dairy construction would be expected to average about 16 jobs on Kaua'i, and 8 on O'ahu. Construction employment would be expected to average about 12 jobs per year during the development period. Thus direct-plus-indirect employment association with construction would be expected to average approximately 36 jobs, of which 28 would be on Kaua'i.

The HDF project would contribute to diversification of Kaua'i's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Hawai'i Island), approximately10 percent of Hawai'i's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and indirect full-time equivalent jobs on Kaua'i, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on O'ahu.

HDF is expected to generate a net income of approximately $68,000 to the County when the 699 cow herd is established. When the dairy has matured to full production for the 699 cow dairy, net income to the State is calculated at $160,000 annually. With the potential contemplated herd size of up to 2,000 mature dairy cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be produced. This would double local milk production currently supplied by operational dairies on the Island of Hawai'i.

Additional employment generated by a possible expansion to accommodate the contemplated 2,000 mature dairy cow herd is estimated at approximately 3 construction jobs plus 4 indirect jobs on Kaua'i, and 2 indirect jobs on O'ahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an additional 5 full-time farm jobs would be added, with approximately 15 additional indirect jobs on Kaua'i and another 8 indirect jobs on O'ahu.

The dairy is expected to generate a net additional contribution to the County of approximately $8,000 for improvements related to expansion for the contemplated herd size of up to 2,000 mature dairy cows ($76,000 total versus $68,000 for the committed herd size). The State will derive approximately $360,000 annually in revenues from the contemplated 2,000-mature dairy cow dairy.

Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhā'ulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhā'ulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Po'ipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhā'ulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered

volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawai'i Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhā'ulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhā'ulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhā'ulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kaua'i community.

Regional Water Demand: The adjacent, developed Kōloa-Po'ipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kaua'i will increase county-wide by 17,300 residents by 2030. The South Kaua'i population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kaua'i region (the Kōloa - Po'ipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well

water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhā'ulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhā'ulepū watershed.

The HDF site is located on the bottom-land of the upper Māhā'ulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Ha'upu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhā'ulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kaua'i Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhā'ulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhā'ulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs

from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhāʻulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Poʻipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kauaʻi community.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawaiʻi Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

February 21, 2015

Laura McIntyre
State of Hawai'i
Department of Health
1250 Punchbowl Street
Honolulu, HI 96813

RE: **COMMENT ON HAWAI'I DAIRY FARM'S ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE, DATED JANUARY 2015.**

Dear Ms. McIntyre,

My husband and I have many concerns regarding this proposed Hawai'i Dairy Farm (HDF) in Maha'ulepu on Kaua'i. We have lived in our home in the Bay View House Lots of Poipu Kai, just adjacent to the Grand Hyatt Resort and Spa, for over 17 years. It had long been a dream of ours to live here and enjoy the beauty and peace that this area offered. Now that we are about to retire and realize that dream, along comes (HDF). Even without (HDF) completed we are suffering financial loss on our property investment. As much as $500.000.00 already and not a single cow in place yet. Just that fact that this project could come to fruition we have lost THAT much value. We have been told that if completed our total value would go down by at least 50%. That's one heck of a hit! These are our selfish reasons for not wanting HDF in our area, following are all the other reasons this just does not make any sense.

The environment in Maha'ulepu cannot handle the dairy. The resources, our wells, cannot handle the contamination that will come with that much waste. The airborne fumes from the waste (urine and solid), the flies will be horrible and we are down wind most of the time. The soil will not handle this and will then go on to contaminate not just the land but the ocean and marine environment. We fish out there and feed our families, we enjoy the beach and marine life, Hawaiian Monk Seals frequent the beaches of Maha'ulepu, and of give birth and raise their pups there. Hawaiian Monk Seals are on the Endangered List and are the most endangered marine mammal in the United States. As an endemic species of the Hawaiian Islands they feed and breed in the waters, sleep on our beaches. Maha'ulepu is one of their habitat and would be forever ruined.

Our drinking water wells are located adjacent to these effluent ponds and stand to become contaminated forever. Where will we get our drinking water? And speaking of water, where will this 3 million gallons of water they need per day come from? The water from the mountains that collects in Waita Reservoir belongs to all of us and is not for sale to HDF by their landlord. What about flooding, such as happened in 2006? The whole valley out there was under water and they were spilling overflow from Waita that ran to Maha'ulepu. What will happen to their containment ponds where we have rains like that?

We could go on and on why all this does not make sense to place a dairy in such a sensitive area, we have to consider the cultural significance of this area also before it's too late!

I hope these and all the other factors involved will be carefully weighed in the decision made regarding HDF. We are AGAINST this plan. We do not want to see the south shore of Kaua'I ruined forever. Too many people's lives depend on the economy here and the whole Island will suffer a loss in tourism if no one wants to come to Poipu.

Sincerely,

Ronalee Eckberg

Eric Eckberg

Eric Eckberg
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808-635-4354
Email: ronalee65@yahoo.com

GROUP 70 INTERNATIONAL

May 26, 2016

Ronalee and Eric Eckberg
P.O. Box 1088
Koloa, HI 96756
ronalee65@yahoo.com

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Ronalee and Eric Eckberg:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

DAIRY OPERATIONS: Hawai'i Dairy Farms (HDF) will establish and operate a sustainable, pastoral rotational-grazing dairy farm in Māhā'ulepū Valley on the island of Kaua'i to produce fresh, locally available nutritious milk for Hawai'i families. The rotational-grazing method utilizes 100 percent of the cows' manure as natural fertilizer to grow pasture grass as a primary source of nutrition for dairy cows. This cost-effective method will reduce reliance on imported fertilizer and feed. Pasture grass will comprise at least 70 percent of the animals' diet. As a part of the Draft Environmental Impact Statement (EIS), the proposed facilities and operations for the dairy farm are described in Chapter 3.

The Environmental Impact Statement (EIS) Preparation Notice (EISPN), published January 23, 2015, described the proposed pasture-based rotational grazing system

as a "zero-discharge, grass-fed dairy". The term "zero-discharge" under the U.S. Environmental Protection Agency related to concentrated feeding operations (CAFO) is a system designed to not discharge pollutants into waters of the United States. As noted previously, the HDF system is designed to utilize 100 percent of the cows' manure on-site. However, nutrients would be introduced to the HDF site with any use; the Draft EIS identifies the amount of nutrients anticipated from the proposed dairy operations that could pass through to ground and surface waters. Therefore, HDF elected to discontinue use of the term "zero discharge" as it was construed as no nutrients into the system.

The term "grass-fed" was used in the HDF EISPN. This term was used to identify HDF's intent to utilize a locally-produced feedstock – grass – for more than 70 percent of the dairy herds' diet. In January 2016, the U.S. Department of Agricultural (USDA) Marketing Survey created a narrow legal definition of "grass-fed". The USDA standard defines what animals can and cannot be fed. The Food Alliance, a project of several northwest colleges, believes that when consumers choose grass-fed products there is an expectation that these will come from animals raised on pasture on a forage-based diet. Due to the evolving definition of "grass-fed", the term in not used in this EIS.

The dairy facilities will occupy an area of approximately 10 acres on the western boundary of the site. The developed area "footprint" will be less than 2 percent of the total farm area. Four buildings will be constructed to serve different functions, supported by utilities and infrastructure. Additional building information can be found in Draft EIS Section 3.3.1.

Agricultural infrastructure and utilities required for the dairy operations will include storage tanks and silos, effluent storage ponds, livestock water systems, and drainage improvements. The irrigation system and distribution of livestock water are discussed in Draft EIS Section 3.5, Pasture Management.

The pastoral rotational-grazing dairy provides a local feedstock – grass – as the herd's primary food source. Reducing imported feed stabilizes costs and provides a food source closer to the natural diet of cows. Results of grass trials initially conducted at five sites across four Hawaiian Islands were instrumental in identifying appropriate varieties of grass, and suitable sites to support sufficient "dry matter" grass yields essential to a cow's diet. Additional project-specific trials at the Māhāʻulepū site on Kauai have been conducted for more than 18 months. The results have identified sufficient yield and nutrition to supply 70 percent of the cows' diet; improvements in grass productivity are anticipated to provide up to 85 percent of cows' diet.

The pasture-based model allows cows to move about freely, and to lie down and rest, which is part of the digestion cycle. The animals are managed in social groups known as "mobs", mimicking the natural social order of bovines. Cows spend 22 hours of each 24-hour period foraging on pasture or resting, outdoors in natural light and fresh air. The gently sloped paddocks, walkways and races minimize the energy expended by the mature dairy cows as they graze or are transferred to and from the various paddocks and the mature dairy facility; surfaces of the walkways

and cow races are designed to provide a comfortable path under hoof. The management practices and pasture model applied by HDF maximizes grass as the cows' primary nutrition source and minimizes stress to the animals. Cows tend to be healthier and live longer, productive lives with access to fresh air, high quality feed, and exercise while they forage.

The 470 acres of pasture will be divided into paddocks averaging 3 to 5 acres in size. Smaller paddocks located near the dairy facility will be used as temporary pasture for cows or calves being moved on or off the farm. To protect the water quality of surface water and downstream areas, paddock fences are set back 35 feet from the edge of drainage ways throughout the site. Existing vegetation within the setbacks will be managed or restored to reduce erosion, improve stability of ditch banks, increase net carbon storage, and improve and maintain water quality.

The majority of the pastures will be irrigated with non-potable water and/or diluted effluent through either the pivot irrigation systems or through gun irrigators. Irrigation water supply is provided to the farm from Waita Reservoir, and will be filtered and pumped to the various irrigation components on the farm. The irrigation system is controlled using computer software and GPS receivers to allow very precise application of irrigation and/or diluted effluent on the pasture. The pivots can rotate and apply irrigation water and/or diluted effluent at different rates depending on the actual irrigation needs of the farm.

NRCS provides technical guidance on applying agricultural waste depending on the desired use of the waste. Reflected in the title of the livestock waste guidance for Hawaiʻi is the parenthetical inclusion of the word "nutrients." Where waste is utilized as a resource, it is being used for the constituent components that provide benefit.

The NRCS Conservation Practice Standard 590, Nutrient Management, applies to commercial fertilizers, organic by-products, waste water, organic matter, and irrigation water. Nutrient management is the practice of managing the amount, rate, source, method of application, and timing of plant nutrients and soil amendments. The timing and application of nutrients will correspond with plant uptake, soil properties and weather conditions. For more information on nutrient balance management see Draft EIS Section 3.5.3, and Draft EIS Appendix D.

The effluent storage ponds are sized to accommodate 30 days of storage for up to 2,000 mature dairy cows, and over 85 days of storage for 699 mature dairy cows. It will be highly unlikely that the storage pond will be full at any time for the contemplated 2,000-cow dairy, and nearly impossible for the committed 699-cow dairy. Throughout the less than 30-day storage period, effluent is planned for application every four days, and the slurry application is expected at least once every 45 days, to ensure that the ponds are kept at manageable levels.

Cows lactate milk following the birth of calves. Newborn calves will be housed on the Māhāʻulepū site and provided essential colostrum and nutrients for a healthy start. During the calves' initial 90 days, they will be transitioned to pasture at HDF before transfer to ranches on Kauaʻi to be raised off-site. The committed herd size of

699 mature dairy cows at the Māhāʻulepū site applies to mature mature dairy cows. Animals in various stages of lactation and rest will be transferred between HDF and other partner ranches as needed for animal health and dairy productivity. This will benefit both the dairy and infuse the beef market in Hawaiʻi with a new, local source of pasture-raised calves. Male calves will become part of the beef cattle herd; heifers (young female calves that haven't given birth) will be raised until ready to return to the HDF herd as a birthing/mature dairy cow. For more information on off-site herd management, refer to Section 3.7 of the Draft EIS.

Health of the herd is of primary importance as the success of a dairy relies on cows effectively producing quality milk. All cows will be treated with a high standard of care. Dairy managers and caretakers will be trained and competent in handling animals to minimize stress and ensure the herds' welfare. A licensed veterinarian may prescribe use of antibiotics approved by the Food & Drug Administration (FDA) for treatment of illnesses. Adherence to guidelines that prohibit milk from cows undergoing antibiotic treatment will ensure no adulteration of milk. Routine laboratory tests of milk for traces of antibiotic residue will be conducted. HDF will not inject cows with bovine growth hormone, referred to as rBST or rBGH.

SOILS: Soil is an ecosystem that can be managed to provide nutrients for plant growth, to absorb and hold rainwater for use during dryer periods, to filter and buffer potential pollutants from leaving fields, to serve as a firm foundation for agricultural activities, and to provide habitat for soil microbes to flourish and diversify to keep the ecosystem healthy. Two rounds of independent soil sampling were undertaken at HDF to understand and characterize available soil nutrients and conditions. Section 4.3 of the Environmental Impact Statement (EIS) characterizes soil conditions, and anticipated impacts from effluent and supplemental nutrient application. Recommendations from Dr. Russell Yost and Nicholas Krueger of the University of Hawaiʻi at Mānoa are summarized. Their baseline nutrient report is included as Appendix C of the Draft EIS.

Soil conservation is a core principal behind establishment of the NRCS, which was formed out of the Soil Conservation Service to acknowledge its expanded role in watershed-scale approach using science-based tools and standards in agronomy, engineering economics, wildlife biology and other disciplines to aid landowners in implementation of conservation practices. NRCS conservation practices are listed in Chapter 3, Section 3.2; these practices codes identify design and construction standards related to drainage, materials, operations and applicable engineering standards. HDF will follow the developed Conservation Plan, which was approved by the West Kauaʻi Soil & Water Conservation District in December, 2013.

The United States Department of Agriculture (USDA) Natural Resources Conservation Services (NRCS) has mapped and classified soils for more than 95 percent of the United States. Comments received during the initial scoping for this EIS included a "Custom Soils Resource Report for Island of Kauaʻi, Hawaiʻi." The report was generated from the USDA NRCS website, which allows any internet user to define an area of interest, customize data results, and generate a Custom Soil Resource Report. The user can select or deselect parameters based upon which data

the user would like to display. These user-generated reports are not evaluated by NRCS.

The NRCS soils classifications and descriptions provide a good information base, however, in-field soils testing is needed to identify existing soil nutrient levels and conditions. The most abundant soil types at the HDF site are Kalihi Clay at 32 percent, Kaʻena Clay Brown Variant at 29 percent, and Lualualei Clay at roughly 14 percent of the dairy site. Laboratory analysis of soil samples collected in 2014 identified levels of pH, phosphorus, nitrogen, potassium, calcium, magnesium, organic matter, salinity, micronutrients and other constituents. The results illustrate that the soils are depleted of nutrients, which is typical for lands formerly used for sugarcane. The soil nutrient status and fertility demands of the primary crop, Kikuyu grass, were used to identify the quantities of nutrients required for productive grass growth. The soils data provide a baseline to guide adaptive nutrient management throughout establishment and maturity of the dairy.

A second round of field sampling was conducted in 2015, and focused on evaluation of soils characterized as "poorly drained", and established a quantitative baseline of soil salinity and sodicity to provide for future monitoring of soil health with application of manure effluent. Laboratory analysis determined electrical conductivity and exchangeable sodium percentage, in addition to nutrient levels of nitrogen phosphorus calcium, magnesium, and potassium.

Poorly drained is not an indication of low or poor infiltration. Infiltration refers to the ability of water to enter the soil surface, whereas "drainage" refers to the movement of water within or from the soil profile. Poorly drained soils typically have low hydraulic conductivity, or a slow rate of groundwater movement through the soil. This slow movement can create anaerobic conditions, which typically result in higher rates of denitrification. This is the conversion of potentially nitrates and nitrites to gaseous forms, which reduces the potential for impacts on waterbodies. In this way, "poorly drained" soils may represent less risk of nitrate and nitrite leaching to associated waterbodies than "well drained" soils (Yost, 2016).

As a result of reduced movement of water through the soil profile, the mobility of nutrients such as potassium and phosphorus is also reduced. Soil types at the HDF site are known to adsorb and retain large amounts of phosphorus. Under the NRCS phosphorus leaching index for Hawaiʻi soils, HDF soils show low risk for leaching. With low risk, phosphorus can be applied at rates greater than crop requirements if manure or other organic materials are used to supply nutrients.

The dairy's focus on robust and healthy grass growth will build organic matter in soils through use of manure as a natural fertilizer. Soil can incorporate carbon from the atmosphere, which benefits soil health. According to recent studies in the Soil Science Society of America Journal, the conversion of formerly tilled cropland to grazed pasture can drive substantial accumulation of organic carbons in soil, with a potential to offset up to one-third of the annual increase in atmospheric carbon dioxide. The potential soil organic matter and carbon dioxide sequestration benefits are likely greatest in highly degraded soils in warm subtropical climates, partly due

to long pasture-growing seasons. Long-term soil impacts are anticipated to result in improvement to the physical, chemical, and biological condition of the soil.

NATURAL HAZARDS: The potential impacts of natural hazards are evaluated in the Draft Environmental Impact Statement (EIS), including flooding, tsunami, earthquakes, and hurricanes. Draft EIS Section 4.6 addresses natural hazards.

The Māhāʻulepū property is not known to experience flooding conditions. The area is located within Federal Emergency Management Agency (FEMA) Zone X, areas determined to be outside the 0.2% annual chance floodplain. The proposed location for Hawaiʻi Dairy Farms (HDF) lies between the 60 and 150 feet elevation, outside the tsunami evacuation zone. The Kauaʻi and Niʻihau region of the Hawaiian Islands has experienced tremors from earthquakes originating further south in the island chain, but no known seismic activity has originated among these northern islands.

Although they occur infrequently, Kauaʻi has received a greater amount of damage from hurricanes when compared to the other Hawaiian Islands. Land management personnel in the Māhāʻulepū region during and following the hurricanes that affected Kauaʻi in 1982 and 1992 observed defoliation of vegetation, and no flooding events in the period following passage of the storms.

Preparedness is the best protection for natural disasters. Structural design of dairy facilities will meet International Building Code (IBC) 2006 standards with local amendments. Provisions in design will address wind loading (including hurricane gusts), rain and flood loading, and earthquake loading. A geotechnical evaluation of the area recommended Seismic Site Class D under IBC standards be utilized for foundation design where the barns and agricultural infrastructure will be constructed.

There has been no rainfall event that would exceed the capacity of the effluent ponds since rainfall has been recorded in Māhāʻulepū Valley. The effluent pond capacity has been designed above the regulatory requirement to contain the 25-year, 24-hour rainfall event. An emergency containment berm with additional capacity for another 30 days is included in the design. This design exceeds regulatory requirements, with containment in excess of the major rainfall events recorded on Kauaʻi over the past three decades.

An emergency preparedness plan for protection of animals has been prepared for HDF internal use that addresses hurricane, fire, and potential flooding hazard scenarios. HDF is not in a tsunami inundation area, so this scenario is not planned for in the disaster plan. The disaster plan relies upon knowledge of cow behavior, and is based on extensive guidance for livestock protection from NRCS, the Florida State Agricultural Response Team (SART), Pennsylvania State College of Agricultural Sciences, and Cornell University Cooperative Extension. The plan includes safety procedures during any disaster, follow up actions, and emergency contacts for assistance before, during or following the event. Further information is provided in the Draft EIS Section 4.6.2.

FLORA AND FAUNA: Botanical, avian, and mammalian surveys of the property were conducted for the Draft Environmental Impact Statement (EIS) to assess existing species on site, including identifying any species listed as endangered, threatened, or proposed under any state or federal endangered species programs in or near the property. EIS Sections 4.9 and 4.10 address the evaluation of flora and fauna resources, with technical studies in Appendix A and B.

A botanical survey of the dairy property was conducted in August 2014 by AECOS Consulting to assess existing plant species. The survey also investigated for the presence of plants currently listed as endangered, threatened or proposed for listing under Federal or the State of Hawaiʻi's endangered species programs, located onsite or within the immediate vicinity of the dairy site. The nature of the land and its present and historical uses for intensive agriculture very much limit the natural botanical resources anticipated to occur on this land. Complete species lists are included in the EIS, and no protected botanical species occur on the project property. The project will include vegetated buffer strips along the drainage ways as part of the Conservation Plan to reduce erosion and stabilize slopes. Where native plants occur or could survive if planted, native plants will be used in the stabilization. No long-term impacts to native plant habitats or endangered or threatened plants species will occur as a result of the dairy.

Avian and mammalian surveys were conducted in August 2014 by Rana Biological Consulting, Inc. This survey was conducted to assess the potential presence of avian or mammalian species currently listed as endangered, threatened or proposed for listing under either Federal or the State endangered species lists. The survey covered the dairy site area and immediate vicinity. Common birds and terrestrial mammals were encountered on the property. There is no critical habitat for endangered species in the upper Māhāʻulepū Valley.

Four species of endangered waterbirds were recorded on the site and at the nearby taro farm located within the HDF site. Though the area does not provide critical habitat, seabirds that nest in upland areas of Kauai may overfly the site. The endangered Hawaiian goose, nēnē was also seen on the site. State Division of Forestry and Wildlife biologists have noted nēnē are regularly seen on the subject property. It is probable that some nest on or adjacent to the site as this species nests in the general Kōloa area, and the habitat present on parts of the site is suitable for nēnē nesting.

The principal potential impacts posed to the five endangered species include those potentially associated with construction activities, and those associated with dairy farm operations following build-out. Measures will be adopted to avoid potential seabird and nēnē goose collisions with fences and structures. Potential measures include lowering construction cranes at night, using conservation fencing to project-specified areas, marking tall structures and fencing with white visibility polytape, limiting nighttime lighting, and shading any outside lights used at night. Ongoing mitigation strategies will be implemented for day-to-day preventative measures, including an Avian Species Protection Plan. Mitigation measures are further described in DEIS Section 4.10.2.

It is also likely that Hawaiian hoary bats overfly the project area on a seasonal basis. While caution will be taken during any potential disturbance or vegetation removal, there are almost no suitable roost trees within the dairy site, thus it is expected that the dairy farm will not affect this listed mammalian species.

DEMOGRAPHIC AND ECONOMIC: The potential impacts of Hawai'i Dairy Farms (HDF) to the existing economy were evaluated in the Draft Environmental Impact Statement (EIS), including a fiscal impact assessment report completed in April, 2016 by Plasch Economics Pacific. Draft EIS Section 4.15 addresses demographic and economic factors, with the complete report in Appendix J.

The HDF project would create short-term benefits through jobs for local construction personnel and local material suppliers. Such jobs would include equipment operators, cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, supervisors, painters, etc. Based on State employment multipliers, indirect employment related to Dairy construction would be expected to average about 16 jobs on Kaua'i, and 8 on O'ahu. Construction employment would be expected to average about 12 jobs per year during the development period. Thus direct-plus-indirect employment association with construction would be expected to average approximately 36 jobs, of which 28 would be on Kaua'i.

The HDF project would contribute to diversification of Kaua'i's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Hawai'i Island), approximately10 percent of Hawai'i's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and indirect full-time equivalent jobs on Kaua'i, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on O'ahu.

HDF is expected to generate a net income of approximately $68,000 to the County when the 699 cow herd is established. When the dairy has matured to full production for the 699 cow dairy, net income to the State is calculated at $160,000 annually. With the potential contemplated herd size of up to 2,000 mature dairy cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be produced. This would double local milk production currently supplied by operational dairies on the Island of Hawai'i.

Additional employment generated by a possible expansion to accommodate the contemplated 2,000 mature dairy cow herd is estimated at approximately 3 construction jobs plus 4 indirect jobs on Kaua'i, and 2 indirect jobs on O'ahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an additional 5 full-time farm jobs would be added, with approximately 15 additional indirect jobs on Kaua'i and another 8 indirect jobs on O'ahu.

The dairy is expected to generate a net additional contribution to the County of

approximately $8,000 for improvements related to expansion for the contemplated herd size of up to 2,000 mature dairy cows ($76,000 total versus $68,000 for the committed herd size). The State will derive approximately $360,000 annually in revenues from the contemplated 2,000-mature dairy cow dairy.

Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhā'ulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhā'ulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Po'ipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhā'ulepū may be connected. Four studies were

conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawai'i Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhā'ulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhā'ulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhā'ulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kaua'i community.

Regional Water Demand: The adjacent, developed Kōloa-Po'ipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kaua'i will increase county-wide by 17,300 residents by 2030. The South Kaua'i population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kaua'i region (the Kōloa - Po'ipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an

increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhā'ulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhā'ulepū watershed.

The HDF site is located on the bottom-land of the upper Māhā'ulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Ha'upu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhā'ulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kaua'i Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhā'ulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhā'ulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has

completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhāʻulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter

periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Poʻipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kauaʻi community.

AIR QUALITY: As a part of the Environmental Impact Statement (EIS), existing air quality conditions and project impacts were evaluated, including dust and odor. Potential odors and emission levels for air pollutants relevant to dairy operations were modeled, as currently there are no cows on site. EIS sections 4.19 and 4.25 provide an evaluation of air quality and odors, including a windrose depicting wind speed and direction in the area (see DEIS Section 4.1, Climate). The full air quality technical report can be found in Draft EIS Appendix I.

Clean Air Act

Under the *Clean Air Act of 1970* (CAA), amended November 1990, the U.S. Environmental Protection Agency (EPA) regulates both large and small sources of air pollutants by establishing National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. The State of Hawai'i has established its own *State Ambient Air Quality Standards* (SAAQS) that are as strict or, in some cases more strict than the NAAQS. State standards prohibit any visible emissions of fugitive dust from construction activities at the property line.

Emissions relevant to livestock operation include particulate matter and fugitive dust. Greenhouse gases related to dairy cows include methane (CH_4) from enteric fermentation, and both methane and nitrous oxide (N_20) emissions from manure application. No State or Federal regulations for greenhouse gas emissions from farm operations or small businesses currently exist.

DUST

Dust will be generated as cows move along soft limestone walkways that connect the paddocks and lead to and from the milking parlor. Potential fugitive dust emission rates were estimated from published literature, where particulate matter (PM) is measurable from the "drylots" of confined dairy operations where animals walk over dirt and dried manure throughout the day.

Applying the emission rates from this available literature greatly overestimates potential emission resulting from HDF. Cows in the pastoral rotational-grazing system will be on pasture 22 hours each day and will spend two hours – in two separate milking cycles –moving to and from the barn for the 10- to 15-minute milking sessions.

Using atmospheric dispersion modeling system (AERMOD), the rates were scaled to the size of the non-pasture areas used by cows at HDF. Results were added to the background concentration of particulate matter (both PM_{10} and $PM_{2.5}$) measured on the island of Kaua'i, and the total concentration was compared to the State ambient air quality standards. Only the contemplated herd size of up to 2,000 mature dairy cows was modeled, as at the lower threshold of 699 cows, the potential fugitive dust impact would be negligible. The estimated concentration for PM_{10} is 2.01 $\mu g/m^3$, well below the State standard of 150 $\mu g/m^3$. The estimated concentration for $PM_{2.5}$ is 0.23 $\mu g/m^3$, well below the Federal standard of 35 $\mu g/m^3$ (see Draft EIS Section 4.19 and Table 4-19.2).

ODOR

Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF, so air dispersion models were used to determine potential odor levels. Local weather data was used in conjunction with the AERMOD modeling system, and published rates for manure odors emissions for dairy heifers and effluent ponds were adapted to reflect the HDF facilities.

Odor emission sources identified for modeling at HDF were manure in the pasture fields, irrigation water containing diluted nutrients from effluent, the effluent storage ponds, and the dairy buildings. Odor rates from published research were applied. Odor isopleths (a line used to map all points having the same numerical value) were created to display the model findings. Odor is described in "odor units" at the threshold of perception, which is defined by the point at which 50 percent of panelists, in laboratory conditions, cannot smell the odor but 50 percent of the panelists can detect the odor.

Modeling results were generated for worst case meteorological conditions (low wind velocity / mixing). Generally, tradewinds will disperse odors to less than detectable levels beyond the HDF site; in periods of no wind, odor may not be dispersed creating the "worst case" scenario. In these periods without normal tradewind flow, the odor plume would extend to the south of the HDF site. Sections 4.19.2 and 4.25.2 of the EIS include graphics of the potential odor isopleths.

Results for the committed herd size of 699 mature dairy cows show that odors may be detectable by 50 percent of the sensitive population once per 200 hours, or 44 hours per year, within an area that extends approximately 1,670-feet (within one-third of a mile) beyond the dairy farm boundary, and does not reach recreational or residential areas. Results for the contemplated expanded herd size of up to 2,000 mature dairy cows show odors would not extend beyond 2,780 feet outside the HDF boundary (just over half a mile), again not reaching recreational or residential areas, and again with detection limited to 50 percent of the sensitive population approximately 44 hours per year. The parameters used in the analysis were intentionally conservative, and the impacts shown assume an unlikely confluence of worst-case meteorological data, irrigation location, and grazing location. Actual offsite odor impacts are likely to be much lower and/or less frequent than shown; it is likely odor detection beyond the HDF boundaries will be less frequent.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

From: bellul@aol.com
To: HDF
Subject: EIS process for Hawaii Dairy Farm on Kauai.
Date: Monday, February 23, 2015 12:35:22 PM
Attachments: Group70-EIS-HDF.pdf

Attention: Jeff Overton.

RE: Hawaii Dairy Farm (Kauai) - EIS Process

Dear Mr. Overton,

Please find attached my letter with our questions and concerns that should be addressed in the EIS Process for the Hawaii Dairy Farm being proposed on Kauai.

Please let us know if you have any questions.

Thanks in advance.

Beverley and Joseph Ellul
Owners Poipu Sands 321
1565 Pe'e Rd,
Koloa, HI
408-203-4700

bellul@aol.com

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My family's farm consisted of 100 acres with a total of 25-30 humanely treated adult purebred Holstein cows. They grazed daily in the summer, spring and fall on 10 – 20 acre pastures in a rotational manner to preserve the soil. The land was also used to grow all of the feed required for the animals. They ate only food grown on the land within the 100 acres. Crops (no corn) were grown and stored for winterfeed and to augment feed when they arrived in the barn for milking twice a day. This was and is sustainable grass-fed dairy farming.

HDF is proposing a "Grass Fed" Dairy with cows grazing on 500 acres of land that is within 4/5th of a mile of the Pacific Ocean at Maha'ulepu. They plan to start production with 699 cows and then move to 2000 cows over time. In HDF's proposal at start-up they will have 115 cows in each 4 acres of paddock area per day and at full production 330 cows on each of these paddocks.

500 acres sounds like a lot of land to graze 699-2000 cows on, but basically it means that during the start-up phase 7 cows would be grazing and defecating on 10,000 square feet of "pasture", the size of a standard house lot. At full production it would mean that at least 17 cows would graze and defecate on the same area.

According to the EPA a dairy cow defecates at least 120 pounds of wet manure every day. In their Waste Management Plan, page 42, HDF reports that they anticipate their dairy cows will each weigh 1,200 pounds and produce 143 pounds of wet manure per cow daily. Using HDF's own waste expectations, at full production HDF's 2,000 cows would produce 2,648 pounds of wet manure on a 10,000 square foot area every day! Imagine having more than one ton of manure added to your lot daily. My husband and I live in a standard house lot of about 10,000 square feet. As I write this and look out my window and try to understand the impact of the concentrated rotational dairy proposed by HDF, I can't imagine anything left of my yard after 17 cows graze, defecate and urinate for even one day. How is HDF going to handle all this manure? How will they keep it from run-off into the wells, streams and ocean? This must be addressed in the EIS.

This manure is not just manure, it is filled with the drugs that the modern farming practices give to these animals such as growth hormones and antibiotics - these will be part of the run-off so how will this affect humans, animals, birds and fish both on land and in the ocean? This too much be addressed in the EIS.

According to HDF, the cows rotate through the grazing paddocks, returning to the pasture paddocks first grazed every 18 days. Not only will the grass be unlikely to re-generate in that short an interval but the manure will still be wet and likely contribute to hoof rot when trampled by the returning herd. This needs to be addressed in the EIS.

The dense grazing will not only sicken the cows, there is also a very real risk to the public's health. There were cases of E.coli in 2006 that were caused by spinach contaminated by feces from cattle nearby. There were 3 deaths and many were sickened. With all the rain on Kauai won't there be a risk of contamination just by run-off? Will the flies carry disease to our food or any containers we eat from? These need to be addressed in the EIS.

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sure these animals are healthy as they need to be examined on a regular basis? This needs to be addressed in the EIS.

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Please ensure that the EIS for this project is being done fairly and based on facts that will ensure that the Poipu Coastline will not be negatively impacted.

Thank you for your consideration.

Sincerely,

Beverley Ellul
bellul@aol.com
1283 Quail Creek Circle,
San Jose, CA 95120
408-203-4700

From: McIntyre, Laura
To: bellul@aol.com
Cc: HDF
Subject: FW: Hawaii Dairy Farm - Kauai - EIS Process
Date: Monday, February 23, 2015 1:56:06 PM
Attachments: HDF-EIS-DOH.pdf

Aloha
This email confirms receipt of your comments regarding the Hawaii Dairy Farms project. Questions and comments on environmental resources will help shape the content of the Draft Environmental Impact Statement. Substantive comments with responses will be published in the Draft EIS.
Thank you for participating in the environmental review process.
Mahalo,
Laura

Laura Leialoha Phillips McIntyre AICP
Program Manager, Environmental Planning Office
Hawaii State Department of Health
919 Ala Moana Blvd. Rm. 312
Honolulu, Hawaii 96814
Direct Phone: (808) 586-4338
Email: laura.mcintyre@doh.hawaii.gov
Website: http://health.hawaii.gov/epo
Ua mau ke ea o ka aina I ka pono

From: bellul@aol.com [mailto:bellul@aol.com]
Sent: Monday, February 23, 2015 12:22 PM
To: EPO
Subject: Hawaii Dairy Farm - Kauai - EIS Process

Dear Ms. McIntyre,

Please find attached our PDF file with questions regarding the Industrial Dairy Farm on Kauai (Hawaii Dairy Farms) EIS process.

Please feel free to contact us if you have any questions.

Please let me know that you have received this letter.

Thank you in advance.

Beverley and Joseph Ellul
Owners Poipu Sands 321
1565 Pe'e Road,
Koloa, HI
408-203-4700

bellul@aol.com

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408-203-4700

-----Original Message-----
From: bellul@aol.com [mailto:bellul@aol.com]
Sent: Mon 2/23/2015 12:25 PM
To: HI Office of Environmental Quality Control
Subject: Kauai Dairy Farm EIS Process (Hawaii Dairy Farms)

To whom it may concern,

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In Industrial Farming a cow has only a 5 year life expectancy. Where will all the deceased animals be disposed if they cannot be used for hamburger meat? Could this be another possible contaminate? This needs to be addressed in the EIS.

HDF will have to bring in additional feed for these animals. From where will this additional feed come? I know that there will be an opportunity for farmers on-island to grow crops but what if that does not happen. When additional feed is brought in from other areas what pests, or other contaminates will be introduced to the environment that could cause disease to the plant, animal and human life on the island? This also needs to be addressed in the EIS.

In the Poipu area, we have wildlife that is already protected like the Monk Seal and the Sea Turtle. We also have a tremendous number of fish species living on the reefs on the island. Will these animals and fish or the reefs be harmed from the run-off? This needs to be addressed in the EIS.

My husband and I rent our home at this time and are responsible for collecting over $13K into the GET and TAT per year. If you multiply that by the number of other vacation rentals in the area it represents a large amount of lost revenue to the State of Hawaii if the tourists stop coming due to odor and flies. Will this possible impact to the state taxes be addressed in the EIS?

Please ensure that the EIS for this project is being done fairly and based on facts that will ensure that the Poipu Coastline will not be negatively impacted.

Thank you for your consideration.

Sincerely,

Beverley Ellul
bellul@aol.com
1283 Quail Creek Circle,
San Jose, CA 95120
408-203-4700

GROUP 70 INTERNATIONAL

May 26, 2016

Beverley and Joseph Ellul
1283 Quail Creek Circle
San Jose, CA 95120
bellul@aol.com

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Beverley and Joseph Ellul:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

GROUP 70 OBJECTIVITY: Group 70 International, Inc. (Group 70) is responsible for the preparation and processing of the Hawai'i Dairy Farms Environmental Impact Statement (EIS). The EIS was prepared in accordance with the requirements of Chapter 343 Hawai'i Revised Statutes and the "Environmental Impact Statement Rules" (Chapter 200 of Title 11, Hawai'i Administrative Rules). The environmental planning team at Group 70 has prepared several hundred Environmental Assessment and EIS documents over the past 40 years, and every document has been accepted by the responsible County, State and Federal agency. On numerous past EIS projects, the Hawai'i Chapter of the American Planning Association has recognized Group 70's professional work with Chapter awards for excellence in environmental planning. Part of the EIS scoping process involves Group 70's

experienced team of technical sub consultants that are well-known and qualified in their respective fields of study. For this project, Group 70 is preparing the Hawai'i Dairy Farms EIS with the level of analysis required to properly evaluate and disclose the existing environmental conditions, probable impacts with mitigation, and potential cumulative and secondary effects.

DAIRY OPERATIONS: Hawai'i Dairy Farms (HDF) will establish and operate a sustainable, pastoral rotational-grazing dairy farm in Māhā'ulepū Valley on the island of Kaua'i to produce fresh, locally available nutritious milk for Hawai'i families. The rotational-grazing method utilizes 100 percent of the cows' manure as natural fertilizer to grow pasture grass as a primary source of nutrition for dairy cows. This cost-effective method will reduce reliance on imported fertilizer and feed. Pasture grass will comprise at least 70 percent of the animals' diet. As a part of the Draft Environmental Impact Statement (EIS), the proposed facilities and operations for the dairy farm are described in Chapter 3.

The Environmental Impact Statement (EIS) Preparation Notice (EISPN), published January 23, 2015, described the proposed pasture-based rotational grazing system as a "zero-discharge, grass-fed dairy". The term "zero-discharge" under the U.S. Environmental Protection Agency related to concentrated feeding operations (CAFO) is a system designed to not discharge pollutants into waters of the United States. As noted previously, the HDF system is designed to utilize 100 percent of the cows' manure on-site. However, nutrients would be introduced to the HDF site with any use; the Draft EIS identifies the amount of nutrients anticipated from the proposed dairy operations that could pass through to ground and surface waters. Therefore, HDF elected to discontinue use of the term "zero discharge" as it was construed as no nutrients into the system.

The term "grass-fed" was used in the HDF EISPN. This term was used to identify HDF's intent to utilize a locally-produced feedstock – grass – for more than 70 percent of the dairy herds' diet. In January 2016, the U.S. Department of Agricultural (USDA) Marketing Survey created a narrow legal definition of "grass-fed". The USDA standard defines what animals can and cannot be fed. The Food Alliance, a project of several northwest colleges, believes that when consumers choose grass-fed products there is an expectation that these will come from animals raised on pasture on a forage-based diet. Due to the evolving definition of "grass-fed", the term in not used in this EIS.

The dairy facilities will occupy an area of approximately 10 acres on the western boundary of the site. The developed area "footprint" will be less than 2 percent of the total farm area. Four buildings will be constructed to serve different functions, supported by utilities and infrastructure. Additional building information can be found in Draft EIS Section 3.3.1.

Agricultural infrastructure and utilities required for the dairy operations will include storage tanks and silos, effluent storage ponds, livestock water systems, and drainage improvements. The irrigation system and distribution of livestock water are discussed in Draft EIS Section 3.5, Pasture Management.

The pastoral rotational-grazing dairy provides a local feedstock – grass – as the herd's primary food source. Reducing imported feed stabilizes costs and provides a food source closer to the natural diet of cows. Results of grass trials initially conducted at five sites across four Hawaiian Islands were instrumental in identifying appropriate varieties of grass, and suitable sites to support sufficient "dry matter" grass yields essential to a cow's diet. Additional project-specific trials at the Māhā'ulepū site on Kauai have been conducted for more than 18 months. The results have identified sufficient yield and nutrition to supply 70 percent of the cows' diet; improvements in grass productivity are anticipated to provide up to 85 percent of cows' diet.

The pasture-based model allows cows to move about freely, and to lie down and rest, which is part of the digestion cycle. The animals are managed in social groups known as "mobs", mimicking the natural social order of bovines. Cows spend 22 hours of each 24-hour period foraging on pasture or resting, outdoors in natural light and fresh air. The gently sloped paddocks, walkways and races minimize the energy expended by the mature dairy cows as they graze or are transferred to and from the various paddocks and the mature dairy facility; surfaces of the walkways and cow races are designed to provide a comfortable path under hoof. The management practices and pasture model applied by HDF maximizes grass as the cows' primary nutrition source and minimizes stress to the animals. Cows tend to be healthier and live longer, productive lives with access to fresh air, high quality feed, and exercise while they forage.

The 470 acres of pasture will be divided into paddocks averaging 3 to 5 acres in size. Smaller paddocks located near the dairy facility will be used as temporary pasture for cows or calves being moved on or off the farm. To protect the water quality of surface water and downstream areas, paddock fences are set back 35 feet from the edge of drainage ways throughout the site. Existing vegetation within the setbacks will be managed or restored to reduce erosion, improve stability of ditch banks, increase net carbon storage, and improve and maintain water quality.

The majority of the pastures will be irrigated with non-potable water and/or diluted effluent through either the pivot irrigation systems or through gun irrigators. Irrigation water supply is provided to the farm from Waita Reservoir, and will be filtered and pumped to the various irrigation components on the farm. The irrigation system is controlled using computer software and GPS receivers to allow very precise application of irrigation and/or diluted effluent on the pasture. The pivots can rotate and apply irrigation water and/or diluted effluent at different rates depending on the actual irrigation needs of the farm.

NRCS provides technical guidance on applying agricultural waste depending on the desired use of the waste. Reflected in the title of the livestock waste guidance for Hawai'i is the parenthetical inclusion of the word "nutrients." Where waste is utilized as a resource, it is being used for the constituent components that provide benefit.

The NRCS Conservation Practice Standard 590, Nutrient Management, applies to commercial fertilizers, organic by-products, waste water, organic matter, and

irrigation water. Nutrient management is the practice of managing the amount, rate, source, method of application, and timing of plant nutrients and soil amendments. The timing and application of nutrients will correspond with plant uptake, soil properties and weather conditions. For more information on nutrient balance management see Draft EIS Section 3.5.3, and Draft EIS Appendix D.

The effluent storage ponds are sized to accommodate 30 days of storage for up to 2,000 mature dairy cows, and over 85 days of storage for 699 mature dairy cows. It will be highly unlikely that the storage pond will be full at any time for the contemplated 2,000-cow dairy, and nearly impossible for the committed 699-cow dairy. Throughout the less than 30-day storage period, effluent is planned for application every four days, and the slurry application is expected at least once every 45 days, to ensure that the ponds are kept at manageable levels.

Cows lactate milk following the birth of calves. Newborn calves will be housed on the Māhāʻulepū site and provided essential colostrum and nutrients for a healthy start. During the calves' initial 90 days, they will be transitioned to pasture at HDF before transfer to ranches on Kauaʻi to be raised off-site. The committed herd size of 699 mature dairy cows at the Māhāʻulepū site applies to mature mature dairy cows. Animals in various stages of lactation and rest will be transferred between HDF and other partner ranches as needed for animal health and dairy productivity. This will benefit both the dairy and infuse the beef market in Hawaiʻi with a new, local source of pasture-raised calves. Male calves will become part of the beef cattle herd; heifers (young female calves that haven't given birth) will be raised until ready to return to the HDF herd as a birthing/mature dairy cow. For more information on off-site herd management, refer to Section 3.7 of the Draft EIS.

Health of the herd is of primary importance as the success of a dairy relies on cows effectively producing quality milk. All cows will be treated with a high standard of care. Dairy managers and caretakers will be trained and competent in handling animals to minimize stress and ensure the herds' welfare. A licensed veterinarian may prescribe use of antibiotics approved by the Food & Drug Administration (FDA) for treatment of illnesses. Adherence to guidelines that prohibit milk from cows undergoing antibiotic treatment will ensure no adulteration of milk. Routine laboratory tests of milk for traces of antibiotic residue will be conducted. HDF will not inject cows with bovine growth hormone, referred to as rBST or rBGH.

FLORA AND FAUNA: Botanical, avian, and mammalian surveys of the property were conducted for the Draft Environmental Impact Statement (EIS) to assess existing species on site, including identifying any species listed as endangered, threatened, or proposed under any state or federal endangered species programs in or near the property. EIS Sections 4.9 and 4.10 address the evaluation of flora and fauna resources, with technical studies in Appendix A and B.

A botanical survey of the dairy property was conducted in August 2014 by AECOS Consulting to assess existing plant species. The survey also investigated for the presence of plants currently listed as endangered, threatened or proposed for listing under Federal or the State of Hawaiʻi's endangered species programs, located onsite or within the immediate vicinity of the dairy site. The nature of the land and its

present and historical uses for intensive agriculture very much limit the natural botanical resources anticipated to occur on this land. Complete species lists are included in the EIS, and no protected botanical species occur on the project property. The project will include vegetated buffer strips along the drainage ways as part of the Conservation Plan to reduce erosion and stabilize slopes. Where native plants occur or could survive if planted, native plants will be used in the stabilization. No long-term impacts to native plant habitats or endangered or threatened plants species will occur as a result of the dairy.

Avian and mammalian surveys were conducted in August 2014 by Rana Biological Consulting, Inc. This survey was conducted to assess the potential presence of avian or mammalian species currently listed as endangered, threatened or proposed for listing under either Federal or the State endangered species lists. The survey covered the dairy site area and immediate vicinity. Common birds and terrestrial mammals were encountered on the property. There is no critical habitat for endangered species in the upper Māhāʻulepū Valley.

Four species of endangered waterbirds were recorded on the site and at the nearby taro farm located within the HDF site. Though the area does not provide critical habitat, seabirds that nest in upland areas of Kauai may overfly the site. The endangered Hawaiian goose, nēnē was also seen on the site. State Division of Forestry and Wildlife biologists have noted nēnē are regularly seen on the subject property. It is probable that some nest on or adjacent to the site as this species nests in the general Kōloa area, and the habitat present on parts of the site is suitable for nēnē nesting.

The principal potential impacts posed to the five endangered species include those potentially associated with construction activities, and those associated with dairy farm operations following build-out. Measures will be adopted to avoid potential seabird and nēnē goose collisions with fences and structures. Potential measures include lowering construction cranes at night, using conservation fencing to project-specified areas, marking tall structures and fencing with white visibility polytape, limiting nighttime lighting, and shading any outside lights used at night. Ongoing mitigation strategies will be implemented for day-to-day preventative measures, including an Avian Species Protection Plan. Mitigation measures are further described in DEIS Section 4.10.2.

It is also likely that Hawaiian hoary bats overfly the project area on a seasonal basis. While caution will be taken during any potential disturbance or vegetation removal, there are almost no suitable roost trees within the dairy site, thus it is expected that the dairy farm will not affect this listed mammalian species.

DEMOGRAPHIC AND ECONOMIC: The potential impacts of Hawai'i Dairy Farms (HDF) to the existing economy were evaluated in the Draft Environmental Impact Statement (EIS), including a fiscal impact assessment report completed in April, 2016 by Plasch Economics Pacific. Draft EIS Section 4.15 addresses demographic and economic factors, with the complete report in Appendix J.

The HDF project would create short-term benefits through jobs for local construction personnel and local material suppliers. Such jobs would include equipment operators, cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, supervisors, painters, etc. Based on State employment multipliers, indirect employment related to Dairy construction would be expected to average about 16 jobs on Kaua'i, and 8 on O'ahu. Construction employment would be expected to average about 12 jobs per year during the development period. Thus direct-plus-indirect employment association with construction would be expected to average approximately 36 jobs, of which 28 would be on Kaua'i.

The HDF project would contribute to diversification of Kaua'i's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Hawai'i Island), approximately10 percent of Hawai'i's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and indirect full-time equivalent jobs on Kaua'i, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on O'ahu.

HDF is expected to generate a net income of approximately $68,000 to the County when the 699 cow herd is established. When the dairy has matured to full production for the 699 cow dairy, net income to the State is calculated at $160,000 annually. With the potential contemplated herd size of up to 2,000 mature dairy cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be produced. This would double local milk production currently supplied by operational dairies on the Island of Hawai'i.

Additional employment generated by a possible expansion to accommodate the contemplated 2,000 mature dairy cow herd is estimated at approximately 3 construction jobs plus 4 indirect jobs on Kaua'i, and 2 indirect jobs on O'ahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an additional 5 full-time farm jobs would be added, with approximately 15 additional indirect jobs on Kaua'i and another 8 indirect jobs on O'ahu.

The dairy is expected to generate a net additional contribution to the County of approximately $8,000 for improvements related to expansion for the contemplated herd size of up to 2,000 mature dairy cows ($76,000 total versus $68,000 for the committed herd size). The State will derive approximately $360,000 annually in revenues from the contemplated 2,000-mature dairy cow dairy.

Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhā'ulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhā'ulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Po'ipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhā'ulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawai'i Department of Health Milk

Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhāʻulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhāʻulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhāʻulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kaua'i community.

Regional Water Demand: The adjacent, developed Kōloa-Po'ipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kaua'i will increase county-wide by 17,300 residents by 2030. The South Kaua'i population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kaua'i region (the Kōloa - Po'ipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhāʻulepū Surface

Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhāʻulepū watershed.

The HDF site is located on the bottom-land of the upper Māhāʻulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Ha'upu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhāʻulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kaua'i Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhāʻulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhāʻulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhāʻulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Poʻipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kauaʻi community.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

From: arthaus@roadrunner.com
To: HDF
Cc: epo@doh.hawaii.gov
Subject: Questions for EIS; Hawaiian Dairy Farms, Maha"ulepu
Date: Tuesday, February 24, 2015 9:19:47 AM
Attachments: EIC Questions from Russell Faraldi and Michele Molineaux Faraldi of 3116 Poipu Road.pdf

Aloha,

Contained as anattachment to this email is a document as PDF containing 11 questions my wife and I would like to see answered concerning the impact of this project.

Regards,

Mr & Mrs. Russell Faraldi
3116 Poipu Road
Koloa, Hawaii. 96756

EIC Questions from **Russell Faraldi and Michele Molineaux Faraldi of 3116 Poipu Road, Koloa, HI 96756**

1) With the area soil being over lava rock, a very porous material with caverns and tubes how can the dairy negate any contaminates such as the build up of phosphates, chemicals from going to the ocean? And how will the pollution be monitored

2) With the amount of cows daily on each "pad"/section rotating over time – what is the assurance that the grass will grow in a timely manor to absorb the urine and phosphates? Seems like there is not enough time between in the rotation of animals through the paddock system to insure the ground and grass are stable?

3) What will be the program, on part of the dairy to deal with any stray animals that come onto the property? Is there a protocol? What is it?

4) Will the cemetery on the property for the cows be treated with any natural or chemical compounds? Or is it all natural decomposition? Also this same area is near the petroglyphs and Hawaiian worship sites. Will there be any impact? Short and long term? Please define.

5) What impacts short and long term might any and all ground run off (intentional or non intentional disaster size) have on the ocean, shoreline and reefs in the area? If they are found to have long-term effects will the dairy consider changing the area on the Island where the dairy is being placed?

6) Is the dairy willing to shut down if any problems to the environment are found? Are they willing to put the surrounding environment first?

7) What is the dairy's plan if in fact local homeowner property values are negatively impacted by their development?

8) Is there a contingency program if the project is allowed to move forward and fails ? Please outline in detail how the Dairy plans to restore the environment to its original state as how they found the land.

9) Current plan is to start with 699 cows and grow to 3,000. If the impact of these herds is overpowering to the environment in its ill effects, what would the impact be if the amount of animals were reduced by 25% - 50% - 75% Please define.

10) What impact might the dairy have on all natural plant life in the area?
11) What would the impact on the local animals/insects/life forms in the area?

GROUP 70 INTERNATIONAL

May 26, 2016

Russell Faraldi
3116 Poipu Road
Koloa, HI 96756
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Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Russell Faraldi:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

DAIRY OPERATIONS: Hawai'i Dairy Farms (HDF) will establish and operate a sustainable, pastoral rotational-grazing dairy farm in Māhā'ulepū Valley on the island of Kaua'i to produce fresh, locally available nutritious milk for Hawai'i families. The rotational-grazing method utilizes 100 percent of the cows' manure as natural fertilizer to grow pasture grass as a primary source of nutrition for dairy cows. This cost-effective method will reduce reliance on imported fertilizer and feed. Pasture grass will comprise at least 70 percent of the animals' diet. As a part of the Draft Environmental Impact Statement (EIS), the proposed facilities and operations for the dairy farm are described in Chapter 3.

The Environmental Impact Statement (EIS) Preparation Notice (EISPN), published January 23, 2015, described the proposed pasture-based rotational grazing system

as a "zero-discharge, grass-fed dairy". The term "zero-discharge" under the U.S. Environmental Protection Agency related to concentrated feeding operations (CAFO) is a system designed to not discharge pollutants into waters of the United States. As noted previously, the HDF system is designed to utilize 100 percent of the cows' manure on-site. However, nutrients would be introduced to the HDF site with any use; the Draft EIS identifies the amount of nutrients anticipated from the proposed dairy operations that could pass through to ground and surface waters. Therefore, HDF elected to discontinue use of the term "zero discharge" as it was construed as no nutrients into the system.

The term "grass-fed" was used in the HDF EISPN. This term was used to identify HDF's intent to utilize a locally-produced feedstock – grass – for more than 70 percent of the dairy herds' diet. In January 2016, the U.S. Department of Agricultural (USDA) Marketing Survey created a narrow legal definition of "grass-fed". The USDA standard defines what animals can and cannot be fed. The Food Alliance, a project of several northwest colleges, believes that when consumers choose grass-fed products there is an expectation that these will come from animals raised on pasture on a forage-based diet. Due to the evolving definition of "grass-fed", the term in not used in this EIS.

The dairy facilities will occupy an area of approximately 10 acres on the western boundary of the site. The developed area "footprint" will be less than 2 percent of the total farm area. Four buildings will be constructed to serve different functions, supported by utilities and infrastructure. Additional building information can be found in Draft EIS Section 3.3.1.

Agricultural infrastructure and utilities required for the dairy operations will include storage tanks and silos, effluent storage ponds, livestock water systems, and drainage improvements. The irrigation system and distribution of livestock water are discussed in Draft EIS Section 3.5, Pasture Management.

The pastoral rotational-grazing dairy provides a local feedstock – grass – as the herd's primary food source. Reducing imported feed stabilizes costs and provides a food source closer to the natural diet of cows. Results of grass trials initially conducted at five sites across four Hawaiian Islands were instrumental in identifying appropriate varieties of grass, and suitable sites to support sufficient "dry matter" grass yields essential to a cow's diet. Additional project-specific trials at the Māhāʻulepū site on Kauai have been conducted for more than 18 months. The results have identified sufficient yield and nutrition to supply 70 percent of the cows' diet; improvements in grass productivity are anticipated to provide up to 85 percent of cows' diet.

The pasture-based model allows cows to move about freely, and to lie down and rest, which is part of the digestion cycle. The animals are managed in social groups known as "mobs", mimicking the natural social order of bovines. Cows spend 22 hours of each 24-hour period foraging on pasture or resting, outdoors in natural light and fresh air. The gently sloped paddocks, walkways and races minimize the energy expended by the mature dairy cows as they graze or are transferred to and from the various paddocks and the mature dairy facility; surfaces of the walkways

and cow races are designed to provide a comfortable path under hoof. The management practices and pasture model applied by HDF maximizes grass as the cows' primary nutrition source and minimizes stress to the animals. Cows tend to be healthier and live longer, productive lives with access to fresh air, high quality feed, and exercise while they forage.

The 470 acres of pasture will be divided into paddocks averaging 3 to 5 acres in size. Smaller paddocks located near the dairy facility will be used as temporary pasture for cows or calves being moved on or off the farm. To protect the water quality of surface water and downstream areas, paddock fences are set back 35 feet from the edge of drainage ways throughout the site. Existing vegetation within the setbacks will be managed or restored to reduce erosion, improve stability of ditch banks, increase net carbon storage, and improve and maintain water quality.

The majority of the pastures will be irrigated with non-potable water and/or diluted effluent through either the pivot irrigation systems or through gun irrigators. Irrigation water supply is provided to the farm from Waita Reservoir, and will be filtered and pumped to the various irrigation components on the farm. The irrigation system is controlled using computer software and GPS receivers to allow very precise application of irrigation and/or diluted effluent on the pasture. The pivots can rotate and apply irrigation water and/or diluted effluent at different rates depending on the actual irrigation needs of the farm.

NRCS provides technical guidance on applying agricultural waste depending on the desired use of the waste. Reflected in the title of the livestock waste guidance for Hawaiʻi is the parenthetical inclusion of the word "nutrients." Where waste is utilized as a resource, it is being used for the constituent components that provide benefit.

The NRCS Conservation Practice Standard 590, Nutrient Management, applies to commercial fertilizers, organic by-products, waste water, organic matter, and irrigation water. Nutrient management is the practice of managing the amount, rate, source, method of application, and timing of plant nutrients and soil amendments. The timing and application of nutrients will correspond with plant uptake, soil properties and weather conditions. For more information on nutrient balance management see Draft EIS Section 3.5.3, and Draft EIS Appendix D.

The effluent storage ponds are sized to accommodate 30 days of storage for up to 2,000 mature dairy cows, and over 85 days of storage for 699 mature dairy cows. It will be highly unlikely that the storage pond will be full at any time for the contemplated 2,000-cow dairy, and nearly impossible for the committed 699-cow dairy. Throughout the less than 30-day storage period, effluent is planned for application every four days, and the slurry application is expected at least once every 45 days, to ensure that the ponds are kept at manageable levels.

Cows lactate milk following the birth of calves. Newborn calves will be housed on the Māhāʻulepū site and provided essential colostrum and nutrients for a healthy start. During the calves' initial 90 days, they will be transitioned to pasture at HDF before transfer to ranches on Kauaʻi to be raised off-site. The committed herd size of

699 mature dairy cows at the Māhāʻulepū site applies to mature mature dairy cows. Animals in various stages of lactation and rest will be transferred between HDF and other partner ranches as needed for animal health and dairy productivity. This will benefit both the dairy and infuse the beef market in Hawaiʻi with a new, local source of pasture-raised calves. Male calves will become part of the beef cattle herd; heifers (young female calves that haven't given birth) will be raised until ready to return to the HDF herd as a birthing/mature dairy cow. For more information on off-site herd management, refer to Section 3.7 of the Draft EIS.

Health of the herd is of primary importance as the success of a dairy relies on cows effectively producing quality milk. All cows will be treated with a high standard of care. Dairy managers and caretakers will be trained and competent in handling animals to minimize stress and ensure the herds' welfare. A licensed veterinarian may prescribe use of antibiotics approved by the Food & Drug Administration (FDA) for treatment of illnesses. Adherence to guidelines that prohibit milk from cows undergoing antibiotic treatment will ensure no adulteration of milk. Routine laboratory tests of milk for traces of antibiotic residue will be conducted. HDF will not inject cows with bovine growth hormone, referred to as rBST or rBGH.

NATURAL HAZARDS: The potential impacts of natural hazards are evaluated in the Draft Environmental Impact Statement (EIS), including flooding, tsunami, earthquakes, and hurricanes. Draft EIS Section 4.6 addresses natural hazards.

The Māhāʻulepū property is not known to experience flooding conditions. The area is located within Federal Emergency Management Agency (FEMA) Zone X, areas determined to be outside the 0.2% annual chance floodplain. The proposed location for Hawaiʻi Dairy Farms (HDF) lies between the 60 and 150 feet elevation, outside the tsunami evacuation zone. The Kauaʻi and Niʻihau region of the Hawaiian Islands has experienced tremors from earthquakes originating further south in the island chain, but no known seismic activity has originated among these northern islands.

Although they occur infrequently, Kauaʻi has received a greater amount of damage from hurricanes when compared to the other Hawaiian Islands. Land management personnel in the Māhāʻulepū region during and following the hurricanes that affected Kauaʻi in 1982 and 1992 observed defoliation of vegetation, and no flooding events in the period following passage of the storms.

Preparedness is the best protection for natural disasters. Structural design of dairy facilities will meet International Building Code (IBC) 2006 standards with local amendments. Provisions in design will address wind loading (including hurricane gusts), rain and flood loading, and earthquake loading. A geotechnical evaluation of the area recommended Seismic Site Class D under IBC standards be utilized for foundation design where the barns and agricultural infrastructure will be constructed.

There has been no rainfall event that would exceed the capacity of the effluent ponds since rainfall has been recorded in Māhāʻulepū Valley. The effluent pond capacity has been designed above the regulatory requirement to contain the 25-year, 24-hour rainfall event. An emergency containment berm with additional

capacity for another 30 days is included in the design. This design exceeds regulatory requirements, with containment in excess of the major rainfall events recorded on Kauaʻi over the past three decades.

An emergency preparedness plan for protection of animals has been prepared for HDF internal use that addresses hurricane, fire, and potential flooding hazard scenarios. HDF is not in a tsunami inundation area, so this scenario is not planned for in the disaster plan. The disaster plan relies upon knowledge of cow behavior, and is based on extensive guidance for livestock protection from NRCS, the Florida State Agricultural Response Team (SART), Pennsylvania State College of Agricultural Sciences, and Cornell University Cooperative Extension. The plan includes safety procedures during any disaster, follow up actions, and emergency contacts for assistance before, during or following the event. Further information is provided in the Draft EIS Section 4.6.2.

FLORA AND FAUNA: Botanical, avian, and mammalian surveys of the property were conducted for the Draft Environmental Impact Statement (EIS) to assess existing species on site, including identifying any species listed as endangered, threatened, or proposed under any state or federal endangered species programs in or near the property. EIS Sections 4.9 and 4.10 address the evaluation of flora and fauna resources, with technical studies in Appendix A and B.

A botanical survey of the dairy property was conducted in August 2014 by AECOS Consulting to assess existing plant species. The survey also investigated for the presence of plants currently listed as endangered, threatened or proposed for listing under Federal or the State of Hawaiʻi's endangered species programs, located onsite or within the immediate vicinity of the dairy site. The nature of the land and its present and historical uses for intensive agriculture very much limit the natural botanical resources anticipated to occur on this land. Complete species lists are included in the EIS, and no protected botanical species occur on the project property. The project will include vegetated buffer strips along the drainage ways as part of the Conservation Plan to reduce erosion and stabilize slopes. Where native plants occur or could survive if planted, native plants will be used in the stabilization. No long-term impacts to native plant habitats or endangered or threatened plants species will occur as a result of the dairy.

Avian and mammalian surveys were conducted in August 2014 by Rana Biological Consulting, Inc. This survey was conducted to assess the potential presence of avian or mammalian species currently listed as endangered, threatened or proposed for listing under either Federal or the State endangered species lists. The survey covered the dairy site area and immediate vicinity. Common birds and terrestrial mammals were encountered on the property. There is no critical habitat for endangered species in the upper Māhāʻulepū Valley.

Four species of endangered waterbirds were recorded on the site and at the nearby taro farm located within the HDF site. Though the area does not provide critical habitat, seabirds that nest in upland areas of Kauai may overfly the site. The endangered Hawaiian goose, nēnē was also seen on the site. State Division of Forestry and Wildlife biologists have noted nēnē are regularly seen on the subject

property. It is probable that some nest on or adjacent to the site as this species nests in the general Kōloa area, and the habitat present on parts of the site is suitable for nēnē nesting.

The principal potential impacts posed to the five endangered species include those potentially associated with construction activities, and those associated with dairy farm operations following build-out. Measures will be adopted to avoid potential seabird and nēnē goose collisions with fences and structures. Potential measures include lowering construction cranes at night, using conservation fencing to project-specified areas, marking tall structures and fencing with white visibility polytape, limiting nighttime lighting, and shading any outside lights used at night. Ongoing mitigation strategies will be implemented for day-to-day preventative measures, including an Avian Species Protection Plan. Mitigation measures are further described in DEIS Section 4.10.2.

It is also likely that Hawaiian hoary bats overfly the project area on a seasonal basis. While caution will be taken during any potential disturbance or vegetation removal, there are almost no suitable roost trees within the dairy site, thus it is expected that the dairy farm will not affect this listed mammalian species.

INVERTEBRATE SPECIES: A study of invertebrate species and pest insects was conducted by Steven Lee Montgomery, PhD, Consulting Biologist. The study summarizes the presence or absence of native species or pest species associated with cattle manure in the general Māhāʻulepū area, as well as the parasites and predators on site that control those species. Fieldwork was conducted during September 15-16, 2014. The entire study is included in Draft Environmental Impact Statement (EIS) as Appendix B.

CAVE AND LAVA TUBE INVERTEBRATES

There are no known caves or lava tubes found at or adjacent to the dairy farm property. The Kōloa Lava Tube System, which provides habitat for two endemic cave species, the Kauaʻi Cave Wolf Spider and the Kauaʻi Cave amphipod, is located several miles away from the dairy farm property. Both invertebrates are listed as endangered under the U.S. Endangered Species Act. Not all caves in the Kōloa area contain these invertebrates, as many do not contain the optimal climatological conditions required by these organisms. Neither the botanical and faunal survey nor the invertebrate survey revealed any evidence of lava tubes or caves on the property, and no such features have been reported for the area near the Hawaiʻi Dairy Farms (HDF) site. Thus no cave invertebrate species will be affected by the dairy farm.

INTRODUCED PREDATOR INSECTS

An invertebrate study of manure-associated insects was conducted for the Draft EIS. The study included a field survey that used manure from an adjacent beef cattle herd as a lure, and determined flies and other manure-related insects currently present at the HDF site. Pest insects such as flies can negatively impact livestock

health and production, and are therefore actively managed to prevent stress and loss of productivity at dairy operations.

At the HDF site, two common flies were identified: the stable fly and the horn fly. Both of these flies are widespread throughout the Hawaiian Islands. The greenbottle fly was reared from manure taken back to a laboratory following the field survey. Additionally, flies known to exist on Kauaʻi but not seen at the HDF site during the survey were identified and include the house fly, the dog dung fly, and the chicken dung fly. These pests are common in areas with high pet populations.

In response to cattle-related insect pests, numerous species known to compete with the pests were introduced to Hawaiʻi between 1898 and 1982. Twenty species of predators and competitors to the horn fly were successfully established during that period. Cattle egrets break up dung patties while searching for prey, and were introduced to Hawaiʻi in the late 1950s to control cattle-associated insects. Extensive introduction of dung beetle species resulted in 14 dung beetle species becoming established on Kauaʻi.

A healthy population of dung beetles can bury a dung pat in one to three days, which disrupts reproduction of flies such as the stable fly and horn fly. The stable fly requires approximately 21 days within the dung patty for the immature life stage (egg to pupa) to survive; the horn fly takes 10 to 20 days from egg to adult. Incorporation of the manure into the soil profile by dung beetles removes the habitat these flies require to complete their lifecycle. Research shows that 95 percent fewer horn flies emerged from dung patties containing a dung beetle species that has been identified at the HDF site. Proven control methods for the stable fly include parasitic micro-wasps and spreading out manure.

Among the invertebrates previously introduced to Hawaiʻi to combat livestock-related flies are extremely tiny parasitic wasps that prey on various fly species. The adult wasps could be described as the size of gnat. Using an ovipositor – described by lay people as a "stinger" – the female lays eggs in the larvae or pupa of flies. The male wasp has no such "stinger". See Draft EIS Section 4.11 for a photo providing scale for these tiny, non-stinging wasps.

To minimize potential establishment of pest flies or other insects, food waste generated during the construction phase will be bagged, covered, contained and disposed of in order to limit possible breeding habitat for flies. Inspections of building materials for ants or other insects will be conducted to prevent introduction of new pests to the HDF site. Short-term controls, including mechanical methods (e.g. sticky tapes or ribbons in the milking parlor, or traps with or without attractants) and chemical methods may be used to prevent short-term spikes in pest populations.

Insecticides and herbicides are non-discriminatory and kill beneficial as well as pest insects. Beneficial insects include primary decomposers such as earthworms and dung beetles, and pollinators including bees. Should chemical control be needed for short-term spikes in pest populations, application would be by those qualified, and in accordance with regulatory labeling requirements. HDF will implement long-term

integrated pest management, which utilizes knowledge of the ancient food web among species by disrupting the manure habitat required to complete the fly life cycle. HDF and other ranchers on Kaua'i may choose to engage with the State Department of Agriculture to translocation dung beetle species already introduced on Kaua'i to Māhā'ulepū and other areas where manure-related flies may be a problem.

IMPACT OF SPRAYS ON BEES

Beneficial insects include primary decomposers such as earthworms and dung beetles, and pollinators including bees. Honey bees are an essential part of any agricultural ecosystem, and were observed on site during the invertebrate species survey. Pesticides and herbicides can reduce populations of beneficial insects, which is why HDF will utilize an integrated pest management approach.

It is expected that honey bees will visit water sources set up for the HDF herd. Preventative measures will be built into any open water source to prevent bees from being trapped, and HDF will contact local beekeepers for advice regarding any bees or bee colonies encountered on site. Safe application practices for any unavoidable herbicide or pesticide will be utilized in order to narrowly target the correct pest species without harming other insects and animals in the area. Anyone using herbicides or pesticides will be properly trained and informed, and if a honey bee colony location appears to be a danger to workers or cattle, or to be in danger itself, a local beekeeper will be contacted for advice and removal.

DEMOGRAPHIC AND ECONOMIC: The potential impacts of Hawai'i Dairy Farms (HDF) to the existing economy were evaluated in the Draft Environmental Impact Statement (EIS), including a fiscal impact assessment report completed in April, 2016 by Plasch Economics Pacific. Draft EIS Section 4.15 addresses demographic and economic factors, with the complete report in Appendix J.

The HDF project would create short-term benefits through jobs for local construction personnel and local material suppliers. Such jobs would include equipment operators, cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, supervisors, painters, etc. Based on State employment multipliers, indirect employment related to Dairy construction would be expected to average about 16 jobs on Kaua'i, and 8 on O'ahu. Construction employment would be expected to average about 12 jobs per year during the development period. Thus direct-plus-indirect employment association with construction would be expected to average approximately 36 jobs, of which 28 would be on Kaua'i.

The HDF project would contribute to diversification of Kaua'i's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Hawai'i Island), approximately10 percent of Hawai'i's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and

indirect full-time equivalent jobs on Kaua'i, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on O'ahu.

HDF is expected to generate a net income of approximately $68,000 to the County when the 699 cow herd is established. When the dairy has matured to full production for the 699 cow dairy, net income to the State is calculated at $160,000 annually. With the potential contemplated herd size of up to 2,000 mature dairy cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be produced. This would double local milk production currently supplied by operational dairies on the Island of Hawai'i.

Additional employment generated by a possible expansion to accommodate the contemplated 2,000 mature dairy cow herd is estimated at approximately 3 construction jobs plus 4 indirect jobs on Kaua'i, and 2 indirect jobs on O'ahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an additional 5 full-time farm jobs would be added, with approximately 15 additional indirect jobs on Kaua'i and another 8 indirect jobs on O'ahu.

The dairy is expected to generate a net additional contribution to the County of approximately $8,000 for improvements related to expansion for the contemplated herd size of up to 2,000 mature dairy cows ($76,000 total versus $68,000 for the committed herd size). The State will derive approximately $360,000 annually in revenues from the contemplated 2,000-mature dairy cow dairy.

Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhā'ulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa

series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhāʻulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Poʻipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhāʻulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawaiʻi Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhāʻulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhāʻulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhāʻulepū Valley, HDF

established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kauaʻi community.

Regional Water Demand: The adjacent, developed Kōloa-Poʻipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kauaʻi will increase county-wide by 17,300 residents by 2030. The South Kauaʻi population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kauaʻi region (the Kōloa - Poʻipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhāʻulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhāʻulepū watershed.

The HDF site is located on the bottom-land of the upper Māhāʻulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Haʻupu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhāʻulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and

prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kaua'i Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhā'ulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhā'ulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhā'ulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhā'ulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Po'ipū region were also calculated. Nitrogen input to the marine environment in the Po'ipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Po'ipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kaua'i community.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

Hearts4Kauai

RECEIVED
FEB 23 2015
GROUP 70 INTL

February 20, 2015

State of Hawai'i
Department of Health
1250 Punchbowl Street
Honolulu, HI 96813

RE: EIS – Hawaii Dairy Farm

I am writing to ask about several concerns to be evaluated as part of the EIS to the Hawaii Farms Dairy.

My first concern is the lack of objectivity of Group 70 International conducting an EIS – specifically on waste management since Group 70 International created the waste management process. An independent environmental engineering firm should be evaluating the plan and any mitigations. There is certainly a conflict of interest having the developer critique its own plan.

Second, there will a substantial degradation to the entire Mahaulepu area with a high density heard. For years, local families have been allowed to hike to what is commonly known as "Hidden Beach." This has a spectacular view along the coast line and leads to a secluded beach where many visitors and locals enjoy a quiet day.

Additionally, there are many family traditions of camping at Mahaulepu beach during holidays. All of these activities and way of life will be impacted by gated, fenced areas as well as increase in odor, biting flies, and potential run-off. The dairy insists the feed lot will be zero waste. I am not convinced. The plan to liquefy and spray adjacent fields as a "nutrient fertilizer" will either run off during heavy rains or seep into the ground. Such seepage is likely to reach the water table. These "sprayed" fields are as close as 750 yards from the Koloa water well and nitrate pollution to the water via contamination to the water table is a highly likely scenario as evidenced in other states recently.

Third, there have been no reports on how to mitigate biting flies. An entomologist sent Mayor Carvalho an open letter about the typical 5-mile range of such biting flies and how the flight pattern is likely in swarms. Anyone with a pond or pool will have to contend with swarms of flies which can migrate as far as five miles. This would fully impact all outdoor activities as far as Spouting Horn. All resorts such as the Hyatt, Sheraton, Koloa Landing and shopping at Poipu Village, Kukui'ula, and Spouting Horn would be affected. The National Tropical Botanical Gardens are also within the 5-mile zone of migrating flies. Quality of life would be adversely affected; the economy would also be adversely affected as the shopping areas are also outdoors. This entire issue has not been addressed.

A fourth issue is that of irrigation. Recently the State District Court ruled that a private enterprise Kauai Springs did not have rights to the spring water for commercial purposes. Grove Farm has entered into an agreement to supply water from the Waita reservoir which reverted water rights back to Hawaiian rights after the closure of the Koloa Sugar Mill. Access to the water for use to liquefy all the solid waste is using a water

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source for commercial purposes. Should the legal defense through Office of Hawaiian Affairs retain rights to the water, what source of water is proposed for the dairy?

Lastly, I personally own a home in Poipu. I am less than a mile from the The Grand Hyatt. I have a fish pond in my yard. My neighborhood is only about 2 miles downwind from the proposed site. Having grown up in Colorado and having been around many cattle operations, I am all too familiar with both the odor and fly problem affiliated with such large scale operations. The proposed site for the dairy operation is too close to some of the most coveted real estate in the country. It is certainly too close to my home.

The concept for the dairy is a theory. The only other example, which HDF points to, is the New Zealand effort. The consequences of the New Zealand effort has been disastrous and well documented. Because I value living in Poipu and consider my home and my access to clean beaches, access to pristine waters off of the Mahaulepu coast - integral to my quality of life– I find the proposed site for this large scale dairy to be obviously deficient in analyzing the impact it can have on our lives here.

Maha'ulepu is the wrong location for this project.

Mahalo nui loa

Cheryl Ann Farrell

Cc: Group 70 International, Inc
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GROUP 70 INTERNATIONAL

May 26, 2016

Cheryl Ann Farrell
2598 Waho Street
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hearts4kauai@gmail.com

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Cheryl Ann Farrell:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

GROUP 70 OBJECTIVITY: Group 70 International, Inc. (Group 70) is responsible for the preparation and processing of the Hawai'i Dairy Farms Environmental Impact Statement (EIS). The EIS was prepared in accordance with the requirements of Chapter 343 Hawai'i Revised Statutes and the "Environmental Impact Statement Rules" (Chapter 200 of Title 11, Hawai'i Administrative Rules). The environmental planning team at Group 70 has prepared several hundred Environmental Assessment and EIS documents over the past 40 years, and every document has been accepted by the responsible County, State and Federal agency. On numerous past EIS projects, the Hawai'i Chapter of the American Planning Association has recognized Group 70's professional work with Chapter awards for excellence in environmental planning. Part of the EIS scoping process involves Group 70's

experienced team of technical sub consultants that are well-known and qualified in their respective fields of study. For this project, Group 70 is preparing the Hawai'i Dairy Farms EIS with the level of analysis required to properly evaluate and disclose the existing environmental conditions, probable impacts with mitigation, and potential cumulative and secondary effects.

DAIRY OPERATIONS: Hawai'i Dairy Farms (HDF) will establish and operate a sustainable, pastoral rotational-grazing dairy farm in Māhā'ulepū Valley on the island of Kaua'i to produce fresh, locally available nutritious milk for Hawai'i families. The rotational-grazing method utilizes 100 percent of the cows' manure as natural fertilizer to grow pasture grass as a primary source of nutrition for dairy cows. This cost-effective method will reduce reliance on imported fertilizer and feed. Pasture grass will comprise at least 70 percent of the animals' diet. As a part of the Draft Environmental Impact Statement (EIS), the proposed facilities and operations for the dairy farm are described in Chapter 3.

The Environmental Impact Statement (EIS) Preparation Notice (EISPN), published January 23, 2015, described the proposed pasture-based rotational grazing system as a "zero-discharge, grass-fed dairy". The term "zero-discharge" under the U.S. Environmental Protection Agency related to concentrated feeding operations (CAFO) is a system designed to not discharge pollutants into waters of the United States. As noted previously, the HDF system is designed to utilize 100 percent of the cows' manure on-site. However, nutrients would be introduced to the HDF site with any use; the Draft EIS identifies the amount of nutrients anticipated from the proposed dairy operations that could pass through to ground and surface waters. Therefore, HDF elected to discontinue use of the term "zero discharge" as it was construed as no nutrients into the system.

The term "grass-fed" was used in the HDF EISPN. This term was used to identify HDF's intent to utilize a locally-produced feedstock – grass – for more than 70 percent of the dairy herds' diet. In January 2016, the U.S. Department of Agricultural (USDA) Marketing Survey created a narrow legal definition of "grass-fed". The USDA standard defines what animals can and cannot be fed. The Food Alliance, a project of several northwest colleges, believes that when consumers choose grass-fed products there is an expectation that these will come from animals raised on pasture on a forage-based diet. Due to the evolving definition of "grass-fed", the term in not used in this EIS.

The dairy facilities will occupy an area of approximately 10 acres on the western boundary of the site. The developed area "footprint" will be less than 2 percent of the total farm area. Four buildings will be constructed to serve different functions, supported by utilities and infrastructure. Additional building information can be found in Draft EIS Section 3.3.1.

Agricultural infrastructure and utilities required for the dairy operations will include storage tanks and silos, effluent storage ponds, livestock water systems, and drainage improvements. The irrigation system and distribution of livestock water are discussed in Draft EIS Section 3.5, Pasture Management.

The pastoral rotational-grazing dairy provides a local feedstock – grass – as the herd's primary food source. Reducing imported feed stabilizes costs and provides a food source closer to the natural diet of cows. Results of grass trials initially conducted at five sites across four Hawaiian Islands were instrumental in identifying appropriate varieties of grass, and suitable sites to support sufficient "dry matter" grass yields essential to a cow's diet. Additional project-specific trials at the Māhā'ulepū site on Kauai have been conducted for more than 18 months. The results have identified sufficient yield and nutrition to supply 70 percent of the cows' diet; improvements in grass productivity are anticipated to provide up to 85 percent of cows' diet.

The pasture-based model allows cows to move about freely, and to lie down and rest, which is part of the digestion cycle. The animals are managed in social groups known as "mobs", mimicking the natural social order of bovines. Cows spend 22 hours of each 24-hour period foraging on pasture or resting, outdoors in natural light and fresh air. The gently sloped paddocks, walkways and races minimize the energy expended by the mature dairy cows as they graze or are transferred to and from the various paddocks and the mature dairy facility; surfaces of the walkways and cow races are designed to provide a comfortable path under hoof. The management practices and pasture model applied by HDF maximizes grass as the cows' primary nutrition source and minimizes stress to the animals. Cows tend to be healthier and live longer, productive lives with access to fresh air, high quality feed, and exercise while they forage.

The 470 acres of pasture will be divided into paddocks averaging 3 to 5 acres in size. Smaller paddocks located near the dairy facility will be used as temporary pasture for cows or calves being moved on or off the farm. To protect the water quality of surface water and downstream areas, paddock fences are set back 35 feet from the edge of drainage ways throughout the site. Existing vegetation within the setbacks will be managed or restored to reduce erosion, improve stability of ditch banks, increase net carbon storage, and improve and maintain water quality.

The majority of the pastures will be irrigated with non-potable water and/or diluted effluent through either the pivot irrigation systems or through gun irrigators. Irrigation water supply is provided to the farm from Waita Reservoir, and will be filtered and pumped to the various irrigation components on the farm. The irrigation system is controlled using computer software and GPS receivers to allow very precise application of irrigation and/or diluted effluent on the pasture. The pivots can rotate and apply irrigation water and/or diluted effluent at different rates depending on the actual irrigation needs of the farm.

NRCS provides technical guidance on applying agricultural waste depending on the desired use of the waste. Reflected in the title of the livestock waste guidance for Hawai'i is the parenthetical inclusion of the word "nutrients." Where waste is utilized as a resource, it is being used for the constituent components that provide benefit.

The NRCS Conservation Practice Standard 590, Nutrient Management, applies to commercial fertilizers, organic by-products, waste water, organic matter, and

irrigation water. Nutrient management is the practice of managing the amount, rate, source, method of application, and timing of plant nutrients and soil amendments. The timing and application of nutrients will correspond with plant uptake, soil properties and weather conditions. For more information on nutrient balance management see Draft EIS Section 3.5.3, and Draft EIS Appendix D.

The effluent storage ponds are sized to accommodate 30 days of storage for up to 2,000 mature dairy cows, and over 85 days of storage for 699 mature dairy cows. It will be highly unlikely that the storage pond will be full at any time for the contemplated 2,000-cow dairy, and nearly impossible for the committed 699-cow dairy. Throughout the less than 30-day storage period, effluent is planned for application every four days, and the slurry application is expected at least once every 45 days, to ensure that the ponds are kept at manageable levels.

Cows lactate milk following the birth of calves. Newborn calves will be housed on the Māhāʻulepū site and provided essential colostrum and nutrients for a healthy start. During the calves' initial 90 days, they will be transitioned to pasture at HDF before transfer to ranches on Kauaʻi to be raised off-site. The committed herd size of 699 mature dairy cows at the Māhāʻulepū site applies to mature mature dairy cows. Animals in various stages of lactation and rest will be transferred between HDF and other partner ranches as needed for animal health and dairy productivity. This will benefit both the dairy and infuse the beef market in Hawaiʻi with a new, local source of pasture-raised calves. Male calves will become part of the beef cattle herd; heifers (young female calves that haven't given birth) will be raised until ready to return to the HDF herd as a birthing/mature dairy cow. For more information on off-site herd management, refer to Section 3.7 of the Draft EIS.

Health of the herd is of primary importance as the success of a dairy relies on cows effectively producing quality milk. All cows will be treated with a high standard of care. Dairy managers and caretakers will be trained and competent in handling animals to minimize stress and ensure the herds' welfare. A licensed veterinarian may prescribe use of antibiotics approved by the Food & Drug Administration (FDA) for treatment of illnesses. Adherence to guidelines that prohibit milk from cows undergoing antibiotic treatment will ensure no adulteration of milk. Routine laboratory tests of milk for traces of antibiotic residue will be conducted. HDF will not inject cows with bovine growth hormone, referred to as rBST or rBGH.

PESTS: A study of invertebrate species and pest insects was conducted by Steven Lee Montgomery, PhD, Consulting Biologist in January 2016. The study summarizes the presence or absence of native species or pest species associated with cattle manure in the general Māhāʻulepū area, as well as the parasites and predators that control those species. No federally or state listed endangered or threatened invertebrate species were noted in the survey of the site. A full report and list of species found on site is provided in EIS Section 4.11 and Appendix B.

Flies were identified on the HDF site using manure from neighboring livestock as bait for invertebrates. The two flies associated with livestock are the stable fly and the horn fly, the latter known for biting cattle. These flies and the greenbottle fly are often confused with the house fly. Flies known to exist on Kauaʻi but not seen at the

HDF site include the house fly, the dog dung fly, and the chicken dung fly. These pests are common in areas with high pet populations. It is possible these fly species could inadvertently be brought to the dairy and utilize manure as a food source. HDF will prevent and control fly population growth through diligent clean up and sanitation practices regarding any trash and food waste, as well as through efficient manure composting practices. A full list of site management measures is provided in EIS Section 4.11. The project location does not provide any habitat for *drosophila musaphilia*, the only Kauaʻi species of native Hawaiian fly listed as Endangered or Threatened. Native Drosophila habitat is located many miles away in the high elevation koa-ʻōhiʻa forests.

Fly populations at HDF will be minimized through a process known as Integrated Pest Management (IPM). Essentially, IPM disrupts reproduction with appropriate means at key points in the pest's life cycle. Used in Hawaiʻi for decades, a number of invertebrates and a bird (the cattle egret) were introduced between 1898 and 1950 to reduce livestock-related insects. IPM utilizes knowledge of the ancient food web among species.

An especially important insect to minimize fly breeding habitat in manure is the dung beetle, which buries manure and incorporates it into the soil. Populations of dung beetles found on Kauaʻi and those species already in Māhāʻulepū Valley, will increase with the increased manure food source, thus increasing and speeding breakdown of manure. Dung beetles are specialists in the very important natural process of breaking up and quickly recycling bovine manure pads. The behavioral diversity among dung beetle species will work together to bury dung pats in one to three days, a shorter amount of time than the 10-30 days flies eggs need to hatch.

In the Kōloa-Poʻipū region, pest fly populations are dependent upon food and breeding sources nearby such as dog, cat, and chicken feces. Beef cattle graze in the region on agricultural lands along Ala Kinoiki Road between Kōloa and Poʻipū, and it is likely the livestock-related flies identified at the HDF site occur in this region as well. Localized controls to reduce pest populations need to address breeding sites in and amongst the food and animals wastes within the area. These mitigation measures will make it difficult for flies to breed, and BMPs will be enforced to address any increase in population, therefore it is expected that the dairy farm will not significantly affect recreational and resort areas.

DEMOGRAPHIC AND ECONOMIC: The potential impacts of Hawaiʻi Dairy Farms (HDF) to the existing economy were evaluated in the Draft Environmental Impact Statement (EIS), including a fiscal impact assessment report completed in April, 2016 by Plasch Economics Pacific. Draft EIS Section 4.15 addresses demographic and economic factors, with the complete report in Appendix J.

The HDF project would create short-term benefits through jobs for local construction personnel and local material suppliers. Such jobs would include equipment operators, cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, supervisors, painters, etc. Based on State employment multipliers, indirect employment related to Dairy construction would

be expected to average about 16 jobs on Kaua'i, and 8 on O'ahu. Construction employment would be expected to average about 12 jobs per year during the development period. Thus direct-plus-indirect employment association with construction would be expected to average approximately 36 jobs, of which 28 would be on Kaua'i.

The HDF project would contribute to diversification of Kaua'i's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Hawai'i Island), approximately10 percent of Hawai'i's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and indirect full-time equivalent jobs on Kaua'i, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on O'ahu.

HDF is expected to generate a net income of approximately $68,000 to the County when the 699 cow herd is established. When the dairy has matured to full production for the 699 cow dairy, net income to the State is calculated at $160,000 annually. With the potential contemplated herd size of up to 2,000 mature dairy cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be produced. This would double local milk production currently supplied by operational dairies on the Island of Hawai'i.

Additional employment generated by a possible expansion to accommodate the contemplated 2,000 mature dairy cow herd is estimated at approximately 3 construction jobs plus 4 indirect jobs on Kaua'i, and 2 indirect jobs on O'ahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an additional 5 full-time farm jobs would be added, with approximately 15 additional indirect jobs on Kaua'i and another 8 indirect jobs on O'ahu.

The dairy is expected to generate a net additional contribution to the County of approximately $8,000 for improvements related to expansion for the contemplated herd size of up to 2,000 mature dairy cows ($76,000 total versus $68,000 for the committed herd size). The State will derive approximately $360,000 annually in revenues from the contemplated 2,000-mature dairy cow dairy.

Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement

(EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhā'ulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhā'ulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Po'ipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhā'ulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawai'i Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD

produced by the on-site, existing Māhāʻulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhāʻulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhāʻulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kauaʻi community.

Regional Water Demand: The adjacent, developed Kōloa-Poʻipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kauaʻi will increase county-wide by 17,300 residents by 2030. The South Kauaʻi population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kauaʻi region (the Kōloa - Poʻipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhāʻulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhāʻulepū watershed.

The HDF site is located on the bottom-land of the upper Māhāʻulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Haʻupu

Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhāʻulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kauaʻi Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhāʻulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhāʻulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhāʻulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or

maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater

and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Poʻipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kauaʻi community.

AIR QUALITY: As a part of the Environmental Impact Statement (EIS), existing air quality conditions and project impacts were evaluated, including dust and odor. Potential odors and emission levels for air pollutants relevant to dairy operations were modeled, as currently there are no cows on site. EIS sections 4.19 and 4.25 provide an evaluation of air quality and odors, including a windrose depicting wind speed and direction in the area (see DEIS Section 4.1, Climate). The full air quality technical report can be found in Draft EIS Appendix I.

Clean Air Act

Under the *Clean Air Act of 1970* (CAA), amended November 1990, the U.S. Environmental Protection Agency (EPA) regulates both large and small sources of air pollutants by establishing National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. The State of Hawaiʻi has established its own *State Ambient Air Quality Standards* (SAAQS) that are as strict or, in some cases more strict than the

NAAQS. State standards prohibit any visible emissions of fugitive dust from construction activities at the property line.

Emissions relevant to livestock operation include particulate matter and fugitive dust. Greenhouse gases related to dairy cows include methane (CH_4) from enteric fermentation, and both methane and nitrous oxide (N_20) emissions from manure application. No State or Federal regulations for greenhouse gas emissions from farm operations or small businesses currently exist.

DUST

Dust will be generated as cows move along soft limestone walkways that connect the paddocks and lead to and from the milking parlor. Potential fugitive dust emission rates were estimated from published literature, where particulate matter (PM) is measurable from the "drylots" of confined dairy operations where animals walk over dirt and dried manure throughout the day.

Applying the emission rates from this available literature greatly overestimates potential emission resulting from HDF. Cows in the pastoral rotational-grazing system will be on pasture 22 hours each day and will spend two hours – in two separate milking cycles –moving to and from the barn for the 10- to 15-minute milking sessions.

Using atmospheric dispersion modeling system (AERMOD), the rates were scaled to the size of the non-pasture areas used by cows at HDF. Results were added to the background concentration of particulate matter (both PM_{10} and $PM_{2.5}$) measured on the island of Kaua'i, and the total concentration was compared to the State ambient air quality standards. Only the contemplated herd size of up to 2,000 mature dairy cows was modeled, as at the lower threshold of 699 cows, the potential fugitive dust impact would be negligible. The estimated concentration for PM_{10} is 2.01 $\mu g/m^3$, well below the State standard of 150 $\mu g/m^3$. The estimated concentration for $PM_{2.5}$ is 0.23 $\mu g/m^3$, well below the Federal standard of 35 $\mu g/m^3$ (see Draft EIS Section 4.19 and Table 4-19.2).

ODOR

Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF, so air dispersion models were used to determine potential odor levels. Local weather data was used in conjunction with the AERMOD modeling system, and published rates for manure odors emissions for dairy heifers and effluent ponds were adapted to reflect the HDF facilities.

Odor emission sources identified for modeling at HDF were manure in the pasture fields, irrigation water containing diluted nutrients from effluent, the effluent storage ponds, and the dairy buildings. Odor rates from published research were applied. Odor isopleths (a line used to map all points having the same numerical value) were created to display the model findings. Odor is described in "odor units" at the threshold of perception, which is defined by the point at which 50 percent of

panelists, in laboratory conditions, cannot smell the odor but 50 percent of the panelists can detect the odor.

Modeling results were generated for worst case meteorological conditions (low wind velocity / mixing). Generally, tradewinds will disperse odors to less than detectable levels beyond the HDF site; in periods of no wind, odor may not be dispersed creating the "worst case" scenario. In these periods without normal tradewind flow, the odor plume would extend to the south of the HDF site. Sections 4.19.2 and 4.25.2 of the EIS include graphics of the potential odor isopleths.

Results for the committed herd size of 699 mature dairy cows show that odors may be detectable by 50 percent of the sensitive population once per 200 hours, or 44 hours per year, within an area that extends approximately 1,670-feet (within one-third of a mile) beyond the dairy farm boundary, and does not reach recreational or residential areas. Results for the contemplated expanded herd size of up to 2,000 mature dairy cows show odors would not extend beyond 2,780 feet outside the HDF boundary (just over half a mile), again not reaching recreational or residential areas, and again with detection limited to 50 percent of the sensitive population approximately 44 hours per year. The parameters used in the analysis were intentionally conservative, and the impacts shown assume an unlikely confluence of worst-case meteorological data, irrigation location, and grazing location. Actual offsite odor impacts are likely to be much lower and/or less frequent than shown; it is likely odor detection beyond the HDF boundaries will be less frequent.

ALTERNATIVES: As a part of the DEIS, alternatives were evaluated that could attain the objectives of the action's purpose and need, and were compared with environmental benefits, costs, and risks of each reasonable alternative against those of the proposed dairy project. Further discussion of alternatives can be found in DEIS Section 6.

The DEIS evaluates alternatives that could attain the objectives of the action's purpose and need, and compares environmental benefits, costs, and risks of each reasonable alternative against those of the proposed action. Additionally, reasonable land use alternatives that emerged from public input during the project scoping phase are documented and briefly discussed. The alternatives that do not meet the project purpose are not advanced for analysis of environmental benefits, costs, and risks. The Environmental Impact Statement Rules, Hawai'i Administrative Rules Chapter 11-200 (HRS 11-200) requires a discussion of alternatives that could attain the objectives of the action, regardless of cost. There is no requirement for the alternatives analysis to consider every possible land use.

Four possible land uses that would not meet the project purpose are discussed. Rezoning the land for resort or residential development, or a potential conservation condemnation are two uses that were examined and eliminated from analysis. These options would not be reasonably viable given the existing private land tenure and existing zoning. Two additional alternatives were considered as reasonable land uses as they could be permitted within the existing State Land Use Agricultural District and County Agricultural Zoning District. These options include Agricultural Park with Processing Center, and development of an Agricultural Subdivision. The

alternatives were examined and eliminated from further analysis, however, as they would not fulfill the project purpose.

The analysis, therefore, focuses on alternatives that meet the project purpose. Rigorous exploration and evaluation of the environmental impacts of the alternatives, including those that might enhance environmental quality or avoid, reduce or minimize some or all of the adverse environmental effects, costs and risks. These alternatives include: (1) the development of a Conventional Feedlot Dairy (a non-pasture-based dairy) at the same location; (2) development of the Pasture-Based Dairy at an Alternative Location on Kaua'i; and (3) milk products processing by HDF. The alternative of "No Action" is also evaluated.

The alternatives analysis provides a comprehensive evaluation of the range of potential alternatives, including the two alternative development scenarios. Although the alternatives are potentially reasonable uses under existing zoning and neighboring uses, each fails to comprehensively fulfill the project requirements defined by the eight Project Objectives and the four established Evaluation Criteria (Chapter 2, Sections 2.3.3 and 2.3.4).

The essential differences as compared to the proposed action are highlighted in the following statements.

- Only one of the alternative actions (conventional feedlot alternative) would create a commercial scale dairy operation in Hawai'i, with the capability to produce 10 percent of the State's fresh milk demand thus reducing dependence on imported milk (Objective 1). This alternative, however, would not reduce reliance on costly imported fertilizer and feed (Objective 2); grow local, quality grass as a primary feedstock (Objective 3); and would not utilize 100 percent of manure on site as nutrients to grow forage for dairy cows (Criterion 4).
- None of the alternatives would secure a dairy location that meets the requirements for a pastoral, pasture-based grazing dairy: sufficient contiguous land area; available long-term land tenure; adequate potable water supply; suitable soil properties; gentle slope conditions; and accessibility (Criterion 1).
- One alternative (Agricultural Park) could potentially generate new long-term employment in the agricultural sector on Kaua'i in a wide range of positions including pasture agronomy/soils science, environmental resources management (Criterion 2).
- The Agricultural Park alternative could also develop sustainable food production utilizing Important Agricultural Lands, demonstrating the importance of long-term agricultural leases and capital investment for agricultural infrastructure, water systems and support facilities. (Criterion 3). However, after years of trying, it appears there was limited interest in such a venture.
- Finally, addressing the range of potential environmental impacts (natural, cultural, social and economic) (Objective 8) the two alternative development scenarios would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.

In contrast to the other options considered, the planned agricultural operation of Hawai'i Dairy Farms, was determined to be the most viable option and is the preferred alternative. Of all the alternatives considered, this is the only approach that achieves project objectives and meets each of the four Evaluation Criteria.

- Hawai'i Dairy Farms will create a commercial scale pasture-based dairy operation in Hawai'i, with the capability to provide more than 1,000,000 gallons of the fresh milk demand, reducing dependence on imported milk (Objective 1).
- The planned dairy location meets the requirements of minimum land area, soil properties, slope conditions, water supply, land tenure and availability, and accessibility (Criterion 1).
- The planned action will generate new long-term employment in the agricultural sector on Kaua'i, including pasture agronomy/soils science, veterinary and animal husbandry, environmental resources management, milk/milk processing, and dairy business management (Criterion 2).
- Sustainable food production utilizing Important Agricultural Lands (Criterion 3) will occur with the proposed action, demonstrating the importance of long term agricultural leases, and the ability to draw capital investment for agricultural infrastructure including water systems and support facilities (Criterion 3).
- Address the range of potential environmental impacts by utilizing 100 percent of manure as natural fertilizer to grow the majority of food for cows (Criterion 4). The alternatives evaluated would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.
- Creating an economically viable pasture rotational-grazing model maintains agriculture, retains open space, and provides buffer between highly utilized resort and residential development and sensitive natural or cultural resources (Objective 8).

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI
Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

From: Alan Faye
To: HDF
Cc: Alan Faye
Subject: HAWAII DAIRY FARMS
Date: Monday, February 23, 2015 5:27:09 PM
Importance: High

Aloha Bill and staff ~ you may use any or all of my enclosed testimony for TGI.

I'm sending the following to State of Hawaii, HDF@Group 70int.com; epo@doh.hawaii.gov. as recommeded in todays's TGI.

Others too? Council? Mayor? email addresses?

Mahalo,

Alan

Comments re Hawaii Dairy Farms

Does HDF want to consider relocating their eventual 2,000 dairy cow herd NOW, before having to move it later? The history of milking cow dairy's on Kauai is one of relocating here and there until they all moved off the Island of Kauai.

Starting back in around 1905, Mr. HP Faye started the Waimea Dairy as a part of his Waimea Sugar Mill Co. His in-laws had a dairy in Moloa'a prior to his marriage. He suggested to the Lindsay family, that they relocate their dairy to Waimea; which they did. Over the many years, Waimea Dairy flourished through the late1960's when the milk was delivered by milkmen as far as Hanalei on the North Shore of Kauai. The dairy herd was about 278 milking cows.

As a young teenager, through high school, I worked many "dairy" hours. We mulched sugar cane tops and mixed this with pine-apple bran skins that were dried. We even picked keawe-tree beans, as school kids during World War II for ten cents a burlap bag! There was no "milk-flo" feed coming during the War. Keawe-tree beans kept cows cleaner, along with sugar-cane tops and pineapple bran.

Waimea Dairy was always very careful about cleanliness of the cows, pastures and pasteurizing plant. Near the end of 1969, the Faye family faced a required major expense to update the pasteurizing plant. The decision was made to accept an offer from MeadowGold Milk Co. of Honolulu. They would buy the herd, take over operations, and lease the facilities.

All went well until MeadowGold stopped control of nauseous odor and biting flies. Waimea Sugar Mill Co. closed operations and Kikiaola Land Co. then owned the Waimea Dairy facility. After Hurricane Iniki, Kikiaola converted the many sugar plantation homes into the Waimea Plantation Cottages. Now came the problem of dairy causing a problem with guests at the Waimea Plantation Cottages; a resort. Kind of like HDF being near the Hyatt Resort, hey?

As a result, Kikiaola evicted MeadowGold, who then moved their dairy to Moloa'a; not to process milk, but to produce milk from the cow herd and send to Honolulu for processing and selling. It was not very long that the local residents of Moloa'a manage to evict MeadowGold, claiming bad odors and dirty run-off that polluted Moloa'a Bay.

This begs the question: "Why not relocate the HDF NOW? There are many parcels that should not result in eventual eviction. Example: Kahili Mountain area. This location is away from residential complainers and business ventures. The special New Zealand grass will flourish there. The higher the elevation, the better the growth. The soil is more porous and less likely to generate major run-offs.

Surely with Mr.Case and his 16,000 acres of former Grove Farm lands, can find a more suitable location that is still "ag" than historical Maha'ulepu. I rest my case.

Alan Faye, Princeville 808-826-7630 Feb 23, 2015

May 26, 2016

Alan Faye
safaye@hawaiiantel.net

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Alan Faye:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

DAIRY OPERATIONS: Hawai'i Dairy Farms (HDF) will establish and operate a sustainable, pastoral rotational-grazing dairy farm in Māhā'ulepū Valley on the island of Kaua'i to produce fresh, locally available nutritious milk for Hawai'i families. The rotational-grazing method utilizes 100 percent of the cows' manure as natural fertilizer to grow pasture grass as a primary source of nutrition for dairy cows. This cost-effective method will reduce reliance on imported fertilizer and feed. Pasture grass will comprise at least 70 percent of the animals' diet. As a part of the Draft Environmental Impact Statement (EIS), the proposed facilities and operations for the dairy farm are described in Chapter 3.

The Environmental Impact Statement (EIS) Preparation Notice (EISPN), published January 23, 2015, described the proposed pasture-based rotational grazing system as a "zero-discharge, grass-fed dairy". The term "zero-discharge" under the U.S. Environmental Protection Agency related to concentrated feeding operations

(CAFO) is a system designed to not discharge pollutants into waters of the United States. As noted previously, the HDF system is designed to utilize 100 percent of the cows' manure on-site. However, nutrients would be introduced to the HDF site with any use; the Draft EIS identifies the amount of nutrients anticipated from the proposed dairy operations that could pass through to ground and surface waters. Therefore, HDF elected to discontinue use of the term "zero discharge" as it was construed as no nutrients into the system.

The term "grass-fed" was used in the HDF EISPN. This term was used to identify HDF's intent to utilize a locally-produced feedstock – grass – for more than 70 percent of the dairy herds' diet. In January 2016, the U.S. Department of Agricultural (USDA) Marketing Survey created a narrow legal definition of "grass-fed". The USDA standard defines what animals can and cannot be fed. The Food Alliance, a project of several northwest colleges, believes that when consumers choose grass-fed products there is an expectation that these will come from animals raised on pasture on a forage-based diet. Due to the evolving definition of "grass-fed", the term in not used in this EIS.

The dairy facilities will occupy an area of approximately 10 acres on the western boundary of the site. The developed area "footprint" will be less than 2 percent of the total farm area. Four buildings will be constructed to serve different functions, supported by utilities and infrastructure. Additional building information can be found in Draft EIS Section 3.3.1.

Agricultural infrastructure and utilities required for the dairy operations will include storage tanks and silos, effluent storage ponds, livestock water systems, and drainage improvements. The irrigation system and distribution of livestock water are discussed in Draft EIS Section 3.5, Pasture Management.

The pastoral rotational-grazing dairy provides a local feedstock – grass – as the herd's primary food source. Reducing imported feed stabilizes costs and provides a food source closer to the natural diet of cows. Results of grass trials initially conducted at five sites across four Hawaiian Islands were instrumental in identifying appropriate varieties of grass, and suitable sites to support sufficient "dry matter" grass yields essential to a cow's diet. Additional project-specific trials at the Māhā'ulepū site on Kauai have been conducted for more than 18 months. The results have identified sufficient yield and nutrition to supply 70 percent of the cows' diet; improvements in grass productivity are anticipated to provide up to 85 percent of cows' diet.

The pasture-based model allows cows to move about freely, and to lie down and rest, which is part of the digestion cycle. The animals are managed in social groups known as "mobs", mimicking the natural social order of bovines. Cows spend 22 hours of each 24-hour period foraging on pasture or resting, outdoors in natural light and fresh air. The gently sloped paddocks, walkways and races minimize the energy expended by the mature dairy cows as they graze or are transferred to and from the various paddocks and the mature dairy facility; surfaces of the walkways and cow races are designed to provide a comfortable path under hoof. The management practices and pasture model applied by HDF maximizes grass as the

cows' primary nutrition source and minimizes stress to the animals. Cows tend to be healthier and live longer, productive lives with access to fresh air, high quality feed, and exercise while they forage.

The 470 acres of pasture will be divided into paddocks averaging 3 to 5 acres in size. Smaller paddocks located near the dairy facility will be used as temporary pasture for cows or calves being moved on or off the farm. To protect the water quality of surface water and downstream areas, paddock fences are set back 35 feet from the edge of drainage ways throughout the site. Existing vegetation within the setbacks will be managed or restored to reduce erosion, improve stability of ditch banks, increase net carbon storage, and improve and maintain water quality.

The majority of the pastures will be irrigated with non-potable water and/or diluted effluent through either the pivot irrigation systems or through gun irrigators. Irrigation water supply is provided to the farm from Waita Reservoir, and will be filtered and pumped to the various irrigation components on the farm. The irrigation system is controlled using computer software and GPS receivers to allow very precise application of irrigation and/or diluted effluent on the pasture. The pivots can rotate and apply irrigation water and/or diluted effluent at different rates depending on the actual irrigation needs of the farm.

NRCS provides technical guidance on applying agricultural waste depending on the desired use of the waste. Reflected in the title of the livestock waste guidance for Hawai'i is the parenthetical inclusion of the word "nutrients." Where waste is utilized as a resource, it is being used for the constituent components that provide benefit.

The NRCS Conservation Practice Standard 590, Nutrient Management, applies to commercial fertilizers, organic by-products, waste water, organic matter, and irrigation water. Nutrient management is the practice of managing the amount, rate, source, method of application, and timing of plant nutrients and soil amendments. The timing and application of nutrients will correspond with plant uptake, soil properties and weather conditions. For more information on nutrient balance management see Draft EIS Section 3.5.3, and Draft EIS Appendix D.

The effluent storage ponds are sized to accommodate 30 days of storage for up to 2,000 mature dairy cows, and over 85 days of storage for 699 mature dairy cows. It will be highly unlikely that the storage pond will be full at any time for the contemplated 2,000-cow dairy, and nearly impossible for the committed 699-cow dairy. Throughout the less than 30-day storage period, effluent is planned for application every four days, and the slurry application is expected at least once every 45 days, to ensure that the ponds are kept at manageable levels.

Cows lactate milk following the birth of calves. Newborn calves will be housed on the Māhā'ulepū site and provided essential colostrum and nutrients for a healthy start. During the calves' initial 90 days, they will be transitioned to pasture at HDF before transfer to ranches on Kaua'i to be raised off-site. The committed herd size of 699 mature dairy cows at the Māhā'ulepū site applies to mature mature dairy cows. Animals in various stages of lactation and rest will be transferred between HDF and

other partner ranches as needed for animal health and dairy productivity. This will benefit both the dairy and infuse the beef market in Hawai'i with a new, local source of pasture-raised calves. Male calves will become part of the beef cattle herd; heifers (young female calves that haven't given birth) will be raised until ready to return to the HDF herd as a birthing/mature dairy cow. For more information on off-site herd management, refer to Section 3.7 of the Draft EIS.

Health of the herd is of primary importance as the success of a dairy relies on cows effectively producing quality milk. All cows will be treated with a high standard of care. Dairy managers and caretakers will be trained and competent in handling animals to minimize stress and ensure the herds' welfare. A licensed veterinarian may prescribe use of antibiotics approved by the Food & Drug Administration (FDA) for treatment of illnesses. Adherence to guidelines that prohibit milk from cows undergoing antibiotic treatment will ensure no adulteration of milk. Routine laboratory tests of milk for traces of antibiotic residue will be conducted. HDF will not inject cows with bovine growth hormone, referred to as rBST or rBGH.

NATURAL HAZARDS: The potential impacts of natural hazards are evaluated in the Draft Environmental Impact Statement (EIS), including flooding, tsunami, earthquakes, and hurricanes. Draft EIS Section 4.6 addresses natural hazards.

The Māhā'ulepū property is not known to experience flooding conditions. The area is located within Federal Emergency Management Agency (FEMA) Zone X, areas determined to be outside the 0.2% annual chance floodplain. The proposed location for Hawai'i Dairy Farms (HDF) lies between the 60 and 150 feet elevation, outside the tsunami evacuation zone. The Kaua'i and Ni'ihau region of the Hawaiian Islands has experienced tremors from earthquakes originating further south in the island chain, but no known seismic activity has originated among these northern islands.

Although they occur infrequently, Kaua'i has received a greater amount of damage from hurricanes when compared to the other Hawaiian Islands. Land management personnel in the Māhā'ulepū region during and following the hurricanes that affected Kaua'i in 1982 and 1992 observed defoliation of vegetation, and no flooding events in the period following passage of the storms.

Preparedness is the best protection for natural disasters. Structural design of dairy facilities will meet International Building Code (IBC) 2006 standards with local amendments. Provisions in design will address wind loading (including hurricane gusts), rain and flood loading, and earthquake loading. A geotechnical evaluation of the area recommended Seismic Site Class D under IBC standards be utilized for foundation design where the barns and agricultural infrastructure will be constructed.

There has been no rainfall event that would exceed the capacity of the effluent ponds since rainfall has been recorded in Māhā'ulepū Valley. The effluent pond capacity has been designed above the regulatory requirement to contain the 25-year, 24-hour rainfall event. An emergency containment berm with additional capacity for another 30 days is included in the design. This design exceeds

regulatory requirements, with containment in excess of the major rainfall events recorded on Kaua'i over the past three decades.

An emergency preparedness plan for protection of animals has been prepared for HDF internal use that addresses hurricane, fire, and potential flooding hazard scenarios. HDF is not in a tsunami inundation area, so this scenario is not planned for in the disaster plan. The disaster plan relies upon knowledge of cow behavior, and is based on extensive guidance for livestock protection from NRCS, the Florida State Agricultural Response Team (SART), Pennsylvania State College of Agricultural Sciences, and Cornell University Cooperative Extension. The plan includes safety procedures during any disaster, follow up actions, and emergency contacts for assistance before, during or following the event. Further information is provided in the Draft EIS Section 4.6.2.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhā'ulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhā'ulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Po'ipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhā'ulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawai'i Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhā'ulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhā'ulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhā'ulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kaua'i community.

Regional Water Demand: The adjacent, developed Kōloa-Po'ipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kaua'i will increase county-wide by 17,300 residents by 2030. The South Kaua'i population is estimated to reach 16,855 in 2035, when it is projected to

encompass 19.2 percent of the County population. For the South Kaua'i region (the Kōloa - Po'ipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhā'ulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhā'ulepū watershed.

The HDF site is located on the bottom-land of the upper Māhā'ulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Ha'upu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhā'ulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kaua'i Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhā'ulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhā'ulepū and adjacent watersheds. DOH conducted water sampling

within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhā'ulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhā'ulepū will carry three

times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Poʻipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring

program will be shared with the DOH CWB, dairy neighbors and the local Kauaʻi community.

AIR QUALITY: As a part of the Environmental Impact Statement (EIS), existing air quality conditions and project impacts were evaluated, including dust and odor. Potential odors and emission levels for air pollutants relevant to dairy operations were modeled, as currently there are no cows on site. EIS sections 4.19 and 4.25 provide an evaluation of air quality and odors, including a windrose depicting wind speed and direction in the area (see DEIS Section 4.1, Climate). The full air quality technical report can be found in Draft EIS Appendix I.

Clean Air Act

Under the *Clean Air Act of 1970* (CAA), amended November 1990, the U.S. Environmental Protection Agency (EPA) regulates both large and small sources of air pollutants by establishing National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. The State of Hawaiʻi has established its own *State Ambient Air Quality Standards* (SAAQS) that are as strict or, in some cases more strict than the NAAQS. State standards prohibit any visible emissions of fugitive dust from construction activities at the property line.

Emissions relevant to livestock operation include particulate matter and fugitive dust. Greenhouse gases related to dairy cows include methane (CH_4) from enteric fermentation, and both methane and nitrous oxide (N_20) emissions from manure application. No State or Federal regulations for greenhouse gas emissions from farm operations or small businesses currently exist.

DUST

Dust will be generated as cows move along soft limestone walkways that connect the paddocks and lead to and from the milking parlor. Potential fugitive dust emission rates were estimated from published literature, where particulate matter (PM) is measurable from the "drylots" of confined dairy operations where animals walk over dirt and dried manure throughout the day.

Applying the emission rates from this available literature greatly overestimates potential emission resulting from HDF. Cows in the pastoral rotational-grazing system will be on pasture 22 hours each day and will spend two hours – in two separate milking cycles –moving to and from the barn for the 10- to 15-minute milking sessions.

Using atmospheric dispersion modeling system (AERMOD), the rates were scaled to the size of the non-pasture areas used by cows at HDF. Results were added to the background concentration of particulate matter (both PM_{10} and $PM_{2.5}$) measured on the island of Kauaʻi, and the total concentration was compared to the State ambient air quality standards. Only the contemplated herd size of up to 2,000 mature dairy cows was modeled, as at the lower threshold of 699 cows, the potential fugitive dust impact would be negligible. The estimated concentration for PM_{10} is 2.01 $\mu g/m^3$, well below the State standard of 150 $\mu g/m^3$. The estimated concentration for $PM_{2.5}$

is 0.23 μg/m³, well below the Federal standard of 35 μg/m³ (see Draft EIS Section 4.19 and Table 4-19.2).

ODOR

Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF, so air dispersion models were used to determine potential odor levels. Local weather data was used in conjunction with the AERMOD modeling system, and published rates for manure odors emissions for dairy heifers and effluent ponds were adapted to reflect the HDF facilities.

Odor emission sources identified for modeling at HDF were manure in the pasture fields, irrigation water containing diluted nutrients from effluent, the effluent storage ponds, and the dairy buildings. Odor rates from published research were applied. Odor isopleths (a line used to map all points having the same numerical value) were created to display the model findings. Odor is described in "odor units" at the threshold of perception, which is defined by the point at which 50 percent of panelists, in laboratory conditions, cannot smell the odor but 50 percent of the panelists can detect the odor.

Modeling results were generated for worst case meteorological conditions (low wind velocity / mixing). Generally, tradewinds will disperse odors to less than detectable levels beyond the HDF site; in periods of no wind, odor may not be dispersed creating the "worst case" scenario. In these periods without normal tradewind flow, the odor plume would extend to the south of the HDF site. Sections 4.19.2 and 4.25.2 of the EIS include graphics of the potential odor isopleths.

Results for the committed herd size of 699 mature dairy cows show that odors may be detectable by 50 percent of the sensitive population once per 200 hours, or 44 hours per year, within an area that extends approximately 1,670-feet (within one-third of a mile) beyond the dairy farm boundary, and does not reach recreational or residential areas. Results for the contemplated expanded herd size of up to 2,000 mature dairy cows show odors would not extend beyond 2,780 feet outside the HDF boundary (just over half a mile), again not reaching recreational or residential areas, and again with detection limited to 50 percent of the sensitive population approximately 44 hours per year. The parameters used in the analysis were intentionally conservative, and the impacts shown assume an unlikely confluence of worst-case meteorological data, irrigation location, and grazing location. Actual offsite odor impacts are likely to be much lower and/or less frequent than shown; it is likely odor detection beyond the HDF boundaries will be less frequent.

ALTERNATIVES: As a part of the DEIS, alternatives were evaluated that could attain the objectives of the action's purpose and need, and were compared with environmental benefits, costs, and risks of each reasonable alternative against those of the proposed dairy project. Further discussion of alternatives can be found in DEIS Section 6.

The DEIS evaluates alternatives that could attain the objectives of the action's purpose and need, and compares environmental benefits, costs, and risks of each reasonable alternative against those of the proposed action. Additionally, reasonable land use alternatives that emerged from public input during the project scoping phase are documented and briefly discussed. The alternatives that do not meet the project purpose are not advanced for analysis of environmental benefits, costs, and risks. The Environmental Impact Statement Rules, Hawai'i Administrative Rules Chapter 11-200 (HRS 11-200) requires a discussion of alternatives that could attain the objectives of the action, regardless of cost. There is no requirement for the alternatives analysis to consider every possible land use.

Four possible land uses that would not meet the project purpose are discussed. Rezoning the land for resort or residential development, or a potential conservation condemnation are two uses that were examined and eliminated from analysis. These options would not be reasonably viable given the existing private land tenure and existing zoning. Two additional alternatives were considered as reasonable land uses as they could be permitted within the existing State Land Use Agricultural District and County Agricultural Zoning District. These options include Agricultural Park with Processing Center, and development of an Agricultural Subdivision. The alternatives were examined and eliminated from further analysis, however, as they would not fulfill the project purpose.

The analysis, therefore, focuses on alternatives that meet the project purpose. Rigorous exploration and evaluation of the environmental impacts of the alternatives, including those that might enhance environmental quality or avoid, reduce or minimize some or all of the adverse environmental effects, costs and risks. These alternatives include: (1) the development of a Conventional Feedlot Dairy (a non-pasture-based dairy) at the same location; (2) development of the Pasture-Based Dairy at an Alternative Location on Kaua'i; and (3) milk products processing by HDF. The alternative of "No Action" is also evaluated.

The alternatives analysis provides a comprehensive evaluation of the range of potential alternatives, including the two alternative development scenarios. Although the alternatives are potentially reasonable uses under existing zoning and neighboring uses, each fails to comprehensively fulfill the project requirements defined by the eight Project Objectives and the four established Evaluation Criteria (Chapter 2, Sections 2.3.3 and 2.3.4).

The essential differences as compared to the proposed action are highlighted in the following statements.

- Only one of the alternative actions (conventional feedlot alternative) would create a commercial scale dairy operation in Hawai'i, with the capability to produce 10 percent of the State's fresh milk demand thus reducing dependence on imported milk (Objective 1). This alternative, however, would not reduce reliance on costly imported fertilizer and feed (Objective 2); grow local, quality grass as a primary feedstock (Objective 3); and would not utilize 100 percent of manure on site as nutrients to grow forage for dairy cows (Criterion 4).

- None of the alternatives would secure a dairy location that meets the requirements for a pastoral, pasture-based grazing dairy: sufficient contiguous land area; available long-term land tenure; adequate potable water supply; suitable soil properties; gentle slope conditions; and accessibility (Criterion 1).
- One alternative (Agricultural Park) could potentially generate new long-term employment in the agricultural sector on Kaua'i in a wide range of positions including pasture agronomy/soils science, environmental resources management (Criterion 2).
- The Agricultural Park alternative could also develop sustainable food production utilizing Important Agricultural Lands, demonstrating the importance of long-term agricultural leases and capital investment for agricultural infrastructure, water systems and support facilities. (Criterion 3). However, after years of trying, it appears there was limited interest in such a venture.
- Finally, addressing the range of potential environmental impacts (natural, cultural, social and economic) (Objective 8) the two alternative development scenarios would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.

In contrast to the other options considered, the planned agricultural operation of Hawai'i Dairy Farms, was determined to be the most viable option and is the preferred alternative. Of all the alternatives considered, this is the only approach that achieves project objectives and meets each of the four Evaluation Criteria.

- Hawai'i Dairy Farms will create a commercial scale pasture-based dairy operation in Hawai'i, with the capability to provide more than 1,000,000 gallons of the fresh milk demand, reducing dependence on imported milk (Objective 1).
- The planned dairy location meets the requirements of minimum land area, soil properties, slope conditions, water supply, land tenure and availability, and accessibility (Criterion 1).
- The planned action will generate new long-term employment in the agricultural sector on Kaua'i, including pasture agronomy/soils science, veterinary and animal husbandry, environmental resources management, milk/milk processing, and dairy business management (Criterion 2).
- Sustainable food production utilizing Important Agricultural Lands (Criterion 3) will occur with the proposed action, demonstrating the importance of long term agricultural leases, and the ability to draw capital investment for agricultural infrastructure including water systems and support facilities (Criterion 3).
- Address the range of potential environmental impacts by utilizing 100 percent of manure as natural fertilizer to grow the majority of food for cows (Criterion 4). The alternatives evaluated would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.

- Creating an economically viable pasture rotational-grazing model maintains agriculture, retains open space, and provides buffer between highly utilized resort and residential development and sensitive natural or cultural resources (Objective 8).

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

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Gentlemen,

I have been coming to the Poipu area of Kauai with my family for over 40 years. sixteen years ago I purchased a house at Poi'pu Kai which I gave to my daughters two years ago. The house is rented when we are not in Hawaii, we pay our fair share of state and local taxes. I am very alarmed by the proposal to start an industrial dairy at Maha'ulepu.

I am very familiar with the down side of dairies. This is not a clean industry, although it is a very profitable one. I frequently drive from my home in Salt Lake City to a second home in Sun Valley, Idaho. I also have a part ownership in a farm, 1700 acres, on the Snake River in the heart of the Idaho dairy industry, Hagerman Idaho. The dairy industry has been a good investment for many including local and state governments. It has not been as friendly to those who live with the constant smell of manure in the air, the flies and other insect pests, the huge tractor trailers delivering hay and food to the farms, and the piles of manure stored under tarps to allow "natural fermentation and digestion" in the open air. The anaerobic digesters smell the same.

There have been many reports of the health problems associated with the dairies. These vary from the exacerbation of respiratory diseases, to the pollution of the aquifer. Brain damage caused by excess nitrates in human infants has been well documented, as have reproductive problems, and cancer. The attached article, "Cow Country: The Rise of the CAFO in Idaho...the conflicts between people and cattle are increasing" details the problems of large scale dairy production in detail. The response appears to "pay off the injured" and move them out of the plume of polluted air. Our Governor, Butch Otter, carefully switches to blame to the people using nitrogen containing fertilizer. In southern Idaho the dairy industry will probably not be displaced. There is nothing unique about the landscape; any historical artifacts from the original settlers have long since been removed. It is not Maha'ulepu.

The introduction of a commercial dairy operation into Maha'ulepu will cause irreparable damage to the south shore Kauai, it streams, and beaches. The pollution in Waiopile Stream will increase as the waste from 2000 cattle percolates into the water shed. The changes in nitrate and other pollutants will eventually reach the beaches. The flies and the non-native species of wasp that the dairy proposes to use to counter act them will spread from the dairy to Koloa and Poipu. Golfers will get to experience the smell of cow manure. Most importantly for those in government, tourist visits will decrease and property values will drop. Opportunities for employment will decrease. Income from taxes of all kinds will decrease. HDF can walk away from the project if it turns into an environmental disaster leaving the taxpayers of Kauai and Hawaii to pay the clean up bill. There is nothing in the HDF to provide compensation for these losses. Once the soil of Maha'ulepu is contaminated with dairy pollutants including nitrates, the loss will be long term.

The HDF proposal does not address the public health consequences of polluting the aquifer that we we all depend on, or the expected rise in respiratory illness that accompany industrial dairies. It does not address the accidental importation of invasive species with the cattle and their food. It does not address the loss of one of the most scenic areas of the Island, the down stream consequences of a rainstorm like 2006 which caused one of the dams on the island to fail, or another storm like Iwa or Iniki.

Economically, the upside profitability of the Maha'ulepu dairy is questionable given that the owners of one of the largest dairies in Idaho, Steve Whitesides who boasts in the local Rupert paper that he has 14,000 cattle in his herd, has an industrial dairy operation on the Hamakua Coast 30 miles from Hilo where his Big Island Dairy produces 15,000 gallons of milk a day. Why not 14,000 cattle here too?

In summary, I think the proposed industrial dairy at Maha'ulepu is a bad idea.

Sincerely,

James M. Ferguson, MD

Susan J. Ferguson

Boise Weekly

FEATURES SEPTEMBER 01, 2010

Cow Country: The Rise of the CAFO in Idaho

As mega-dairies and feedlots make up more of Idaho's dairy industry, the conflicts between people and cattle are increasing

By Scott Weaver

On a cool June day, Dean Dimond looked out from his back porch at a field of green wheat bending in the wind. Dimond lives on and farms a patch of land in the Magic Valley just north of Jerome. A mile or so beyond is Minidoka, site of the former Japanese internment camp where the National Park Service is building a memorial.

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ADAM ROSENLUND

CAFO Tour
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Dimond is, by any measure, an enormous man, with frying pan-sized hands that engulf yours in a handshake. He makes his living growing hay and corn for the dairies that populate this area where he has lived nearly all his life. It's a good place for this kind of farming. Three counties in the Magic Valley--Jerome, Gooding and Twin Falls--have the highest concentration of dairies in the state.

So you wouldn't expect Dimond--a self-described staunch Republican--to side with a movement to slow and even stop the expansion of large dairies. But as he looks over the field just feet from his back door, the contradiction begins to make sense.

Over the last two decades, the vision of a dairy has morphed from an idyllic setting to an industrialized, Henry Ford-like factory--the concentrated animal feeding operation. Under the logic of economies of scale, dairies and feedlots grew into expansive operations able to hold tens of thousands of animals.

The wheat field behind Dimond is not his, though you could toss a rock from the porch into its stalks. It belongs to South View Dairy, which for the last three years has fought to construct a 13,000-head feedlot on 240 acres one mile upwind of Minidoka and next to Dimond's home.

"There are a lot of good dairymen out there," said Dimond. "The dairy industry has been really good for this area. There are some that try to take care of their neighbors. But these guys just wanted to come in and build this mega-facility."

The fight over South View became so contentious that Jerome sheriff deputies used metal-detection wands to search the public for weapons before one hearing. During the hearing, a woman was led by a bailiff from the courtroom after refusing to yield the floor to the county commission chairman.

In many ways, South View is emblematic of what former Jerome County Commissioner Diana Obenhauer called a shift in public attitudes about CAFOs in their county.

While the dairy and beef industries are revenue generators for counties and financial bellwethers for the state--Idaho is the fifth-leading producer of milk and dairy products in the nation--many who live and work where CAFOs dominate the physical and environmental landscape are fighting for their property rights and better regulation of operations. And to make their voices heard.

"We all have cows. We all understand them," Dimond said. "But these things need to be located out and away where they can't affect people. These guys came in and wanted to put it right on top of us."

During the 1980s, an exodus of dairies from California reshaped Idaho. By 1997, income from dairy products exceeded those from the state's signature crop, potatoes. The next year, dairy outpaced both potatoes and beef. Dairy operators fleeing California's regulations found in Idaho a state with space and a welcoming attitude.

But the boom didn't translate into more dairies. Between 1991 and 2007, the number of dairies dropped from 1,952 to 648. During the same period, the amount of milk produced skyrocketed from just less than 3 billion pounds to 11 billion pounds.

What was once an industry of small farms has become dependent on CAFOs. The average herd size increased from 91 cows in 1991 to 783 in 2007. The decrease in dairies coupled with the increase in herd sizes puts more animals in fewer concentrated areas.

CAFOs' environmental impacts are evident. Putting 1,000-plus cows in a confined space produces an enormous amount of animal waste that often contains high levels of nitrates, pesticides and pharmaceuticals. If not properly handled, it can leach into surface and ground water. According to a 2006 paper in *Environmental Health Perspectives*, this happens all too often:

"Based on available data, generally accepted livestock waste management practices do not adequately or effectively protect water resources from contamination with excessive nutrients, microbial pathogens and pharmaceuticals present in waste."

The Idaho Department of Environmental Quality has found increasingly elevated nitrate levels in areas heavily populated with CAFOs. These levels are caused by fertilizer applications--including spraying of liquid manure onto fields--and "agricultural activities of confined animal feeding operations." High nitrate levels in water can cause brain damage in infants and has been associated with reproductive problems and cancer, according to researchers at Colorado State University.

According to the DEQ, nitrate is a concern because more than 95 percent of Idaho's drinking water comes from groundwater. The Magic Valley and its CAFOs sit on the Eastern Snake River Plain, the only source of drinking water for 200,000 people in Southern Idaho.

A 2009 DEQ study of the Springdale area in the Magic Valley found that nitrate concentrations "commonly exceed the maximum contamination level." While the study argues that the "emerging contaminants" are "still below human health concerns," it also identified the increase in nitrates from 1993 to 2001, which coincides with the growth of confined cattle. The report carefully hedged the causes of this increase, stating multiple times that "possible sources" include CAFOs and their practices.

However, DEQ cites two ISDA studies in 2003 and 2005 that it says "suggest a connection between agricultural land use and groundwater quality." According to the DEQ, there were roughly 14,000 confined animals within the 22,000 acres of Springdale. According to the 2000 census, Cassia County, where Springdale is located, had a human population of 21,416.

"[The ISDA studies] concluded that nitrate impacts to the shallow aquifer are widespread," the DEQ report stated, "and the leaching of animal waste and use of commercial fertilizers is the likely source of nitrate to ground water."

In 2006, the DEQ found "a statistically significant increasing nitrate trend" in Gooding County, ground zero for dairy CAFOs. A follow-up report in 2009 found that the largest "potential" sources of nitrogen were fertilizer applications (47 percent) and CAFOs (43 percent). The report estimated that dairy cattle produce 2.4 million pounds of nitrogen load a year, more than double the second-leading source, feedlot cattle (983,000 pounds). Like most studies, its recommendations are thread-bare: CAFOs should use "best management practices" to control the amount of nitrogen that reaches the aquifer and springs.

Lee Halper moved to Idaho in 1971 after living in "the filth and corruption" of New York City, Boston and New Jersey. In the late '80s, the Aardema Dairy--the largest dairy complex in the state--moved in over the aquifer that feeds his well. Over the next 25 years, the nitrate levels in his well increased from 1.4 milligrams per liter in 1989 to 7.28 in the fall of 2008. Levels rose as high as 11.02 in 2006. The federal maximum contamination level for nitrate is 10 milligrams per liter.

"There are good CAFO operators and there are bad," Halper said. "Combined with the corruption and ignorance of politicians, this allowance of free reign for 'jobs' is slowly ruining the aquifer, the soil, the roads, the air ... Idaho."

CAFOs also degrade air quality. A 2003 DEQ report on the Treasure Valley found that 64 percent of ammonia emissions came from livestock waste, the largest source. This DEQ study was significant because it contradicted previous environmental impact studies for a proposed 8,000-head dairy CAFO, which ISDA found would have a "minimal" impact on the environment.

If there's one criticism that residents and anti-CAFO activists alike have of ISDA (and there isn't just one), it's that the agency's interests and the interests of the industries it regulates overlap to the point of being indistinguishable at times.

If the word "gadfly" did not exist, it would be necessary to invent it to describe Alma Hasse. The executive director of Idaho Concerned Area Residents for the Environment is also the woman who was kicked out of the South View hearing.

Alma and her daughter, Shavone, are the heart and brains of ICARE. I'm in a car with both as Alma exits I-84 just west of Twin Falls and exclaims, "It's Excrement Alley!"

That's Alma's nickname for Bob Barton Highway, which runs between the Interstate and the Snake River in the Magic Valley. It's also the prime spot for our "Shit Tour," a drive through an expanse of dairy and beef CAFOs tightly packed into the acreage on the north rim of the Snake River Canyon.

Like many in urban areas, my experience with agriculture ends with "Old McDonald." That bucolic idea has been tempered with second-hand knowledge: reading Michael Pollan, et al; watching *Food, Inc.* and various exposes. I expected a certain amount of disgust on the Shit Tour. Even my wildest urban imagination couldn't conjure Excrement Alley.

As we drive by a dairy CAFO, a 4-foot curving berm of cow shit follows along the fence line. Inside are pools of water with a glassy green-brown surface. Liquid shit. Jersey cows stand and lay under the sun. There's nothing green among the cows surrounded by dirt and dust, making it difficult to tell where the earth ends and the shit begins.

After an hour of this, my head begins to ache and my eyes water. It's not even dusk, when the cooling air brings the noxious gases closer to the ground.

As she drives, Alma points out piles of manure and waste lagoons--pits where liquid animal waste is collected until it can be sprayed on fields. A cow staggers through the muck, dazed by the sun.

ICARE is part of the coalition that temporarily stopped the proposed South View facility. Neighbors are still waiting on a ruling as to whether the CAFO can begin construction.

ICARE works with citizens and lobbies for better state regulations on CAFOs. Alma argues CAFOs are Idaho's top public-health threat, negatively affecting water, air and soil quality while making life unbearable for those who live near the largest operations.

"I wish I could charter buses and take the senators and representatives on a tour like this," she said. "And have them look me in the eye after and say that these facilities aren't having any impacts."

At the Snake River Canyon, we walk to the north rim. Hundreds of feet below, the Snake River runs turgid. Nothing breaks the surface of the solid green water.

We're standing on basalt, a porous rock through which surface water easily finds its way into the ground, the aquifer and, ultimately, the river. Thick strands of algae sway languidly. At a bend, the river is full of them, evidence of the elevated level of nitrate. An irrigation canal empties from the southern rim, shooting its water down into the Snake.

"That irrigation return line has probably snaked past no less than a dozen CAFOs," says Alma. "There's probably all kinds of stuff in there. You wouldn't want to drink it, swim in it."

Just months before, my wife and I took a backpacking trip through Hells Canyon, some 300 miles downriver. A park official warned us not to drink or eat anything out of the Snake, even if we boiled and filtered the water, because of all the CAFO run-off.

These are the macro effects. But living in close proximity to a high concentration of CAFOs comes with its own hazards, some of them due to the nature of the operations. Others are due to the nature of the operators.

Though ISDA is tasked with promoting the dairy and beef industries, it also regulates them, ensuring that dairy products are safe to eat and drink. ISDA is also responsible for regulating the health and environmental impact of operations that in many ways have become more like factories.

"We do have a dual role," said Brian Oakey, ISDA deputy director. "We promote agriculture, but we also regulate. We have to reconcile that in all of our programs. If we do not have a credible regulatory agency, then we can't promote the consumer confidence in those products. We view it not as a distinction between the two, but really one in the same. We're doing both: regulating and promoting."

Most people interviewed for this story don't share Oakey's confidence in ISDA. Diana Obenhauer, the former Jerome County commissioner, said ISDA "neglects" its regulatory responsibilities. "They don't do their job," she said flatly. Dean Dimond goes further.

"The Department of Ag is kind of a worthless organization," he said.

After Dimond complained to ISDA about a CAFO illegally pumping its waste, his name appeared in the letter to the operator, essentially outing him to the industry he depends on to make his living. The ISDA inspector for that region stopped taking Dimond's calls.

ISDA permits and inspects operations, collects fees, issues fines and monitors the environment and approves Orwellian-named documents called Nutrient Management Plans, which detail how each operation will safely hold and dispose of animal waste.

Activists point to these NMPs as proof of the industry's cozy relationship with state regulators. NMPs document the amount of waste CAFOs produce and how they handle it. Problems with waste containment lead to illegal discharges. But this information is kept secret from the public thanks to a change made during the last legislative session. The Idaho Legislature labeled stats on cow shit "proprietary information," exempt from public disclosure.

When asked what in an NMP could be considered a trade secret, Oakey said, "Well, I don't know. I'm not a feedlot operator, so I'm not qualified to answer that. We just implement that part of the statute."

Some of ISDA's more aggressive critics, like Obenhauer, question whether ISDA is doing its job. The fact that these NMPs are private worries ICARE and others who want to know what's going on next door. Their concern isn't necessarily whether ISDA is doing its job, it's whether they can trust the agency to look out for the best interests of all Idahoans. Hiding waste information behind the veil of "trade secrets" and stonewalling public information requests--ICARE needed a lawyer to review public documents--has eroded trust in ISDA.

Regulating beef and dairy CAFOs can be a dizzying job. If a CAFO is affecting air quality, making everything smell like cow shit, you have to file a complaint with ISDA ... unless it's fugitive dust (actual particles of shit). If it's dust, you call DEQ. If the CAFO is emitting ammonia, DEQ is your regulatory agency, unless it's a beef CAFO; ammonia emissions aren't subject to a CAFO permit. If a truck accidently dumps manure on your road, ISDA can take care of that, unless the manure came from a beef CAFO, which isn't subject to such strict regulations. If a CAFO discharges waste into stream that then finds its way into another body of surface water, both ISDA and EPA have dual regulatory authority.

Up until May 2009, the EPA had agreements with ISDA and both the beef and dairy industries that let ISDA carry out inspections for both the state and federal agencies. The agreements, called memorandums of understanding, were nationally lauded for being unique programs that eliminated the majority of illegal discharges.

But in 2009, the EPA backed out of both MOUs, worried that its agreement--one that essentially ceded its role of inspecting CAFOs to ISDA--would limit its authority to enforce the Clean Water Act. The EPA was also concerned about the close relationship between industry and ISDA.

"The industry that was supposed to be regulated was also the signatory on those MOUs," Nick Peak of the EPA said. "That was one of the primary concerns."

When the wind picks up in southern Jerome County, life becomes more difficult for Bill Jacob and his family. They are surrounded by three CAFOs in the same square mile and at least 10 within two miles. Dirt, dust and particulate matter--the polite name for pulverized cow shit--are lifted up on the wind and carried to Jacob's house. During the worst times of the year, they have to constantly spray and wash the house to keep the brown clouds from settling.

"The worst is when you get a big storm blowing through. You can literally see a wall of dirt coming. And it's not just dirt."

Jacob's son Kyle, whom he and his wife adopted, died of an asthma attack in March 2008, one of the windiest times of the year.

"We were getting hammered by crap blown off the dairy," he said. "[The cause of Kyle's death] was listed as 'environmental conditions.' But you know, I can't go out there and say there's a smoking gun."

Jacob said there is an "awful lot of evidence" that the dust from the dairies triggered Kyle's asthma attack. "But there's no way we can ever prove it," he said.

Kyle's 3-year-old half sister is already starting to show symptoms of asthma.

The Jacobs moved to their home in February 1993. Since then, the dairies have continually expanded, increasing the size of their herds and the by-products--animal waste--which bring their own set of problems.

"When you have such a tremendous supply of organic rotting material, the flies are phenomenal," said Jacob. "It can be horrendous, literally horrendous. We knew there were dairies in the area when we moved in. The problem is, it's getting worse."

Of all the counties that depend on the influx of CAFOs economically, Jerome County has a reputation as being especially dairy-friendly. When the Ted Miller Dairy on S. 500 Road decided to expand, residents near the dairy were notified of an upcoming public hearing where they would have a chance to give testimony about the proposed expansion.

"We were given virtually no notice," he said.

Jacob received his notification at the beginning of June. Jerome County had given them three-weeks notice of the hearing.

To submit written testimony, residents needed to file it and additional paperwork seven days before the hearing. But in order to give the necessary documents--records of past violations, siting information, correspondence between the dairy and the county commission--residents had to request public documents from DEQ and ISDA, which can take up to 10 days. In this case, the residents against the expansion--roughly 90 percent of the people who live in the area, according to Jacob--had to fight for the documents they needed to show that the Ted Miller Dairy didn't have the resources to handle more cows.

When Jacob got the notice, he called ICARE. Alma and Shavone, lawyer in tow, got the documents the residents needed.

"I give a lot of credit to ICARE," he said. "They pounded a lot of pavement really fast."

Still, residents were only able to submit a portion of the documents they wanted because of the tight deadline and short notification.

Roughly 25 homes around the dairy are one mile or less downwind. Many who live there, in homes built before the dairy moved in, are tied economically to the dairies of Jerome County, whether they work for them or supply them with things like feed.

That a dairy wanted to expand in an area already concentrated with CAFOs was a concern. But that the dairy was the Ted Miller Dairy was another issue. Just one of the 243 dairy CAFOs in Idaho, the Ted Miller Dairy has a curious story.

It began in~~1996~~1980* as C Bar M, a 960-head dairy owned by Greg Ledbetter--who became Idaho's state veterinarian in 2005--and his wife Jane. ISDA records show five discharges or non-compliances in the past 10 years, a violation of the rules governing dairy CAFOs. In 2002 a waste lagoon overflowed, and in 2005 the dairy sprayed waste water from its lagoons on a county road. These types of violations usually point to a larger problem--too much waste and not enough storage capacity.

But the most egregious discharge came in 2008, when a C Bar M honey wagon (a large tanker that hauls liquid manure from lagoons to application fields) dumped its contents into a canal that flows directly into the Snake River. C Bar M was fined $5,800 by the Environmental Protection Agency.

This was the only time that C Bar M has been fined for an illegal discharge. While ISDA had previously fined the dairy for failing to vaccinate more than 100 calves against brucellosis, it has never levied a fine against Ledbetter for the dairy's numerous non-compliances.

After the EPA fine, C Bar M changed its name to the Ted Miller Dairy.*

Multiple calls to the number listed for the Ted Miller Dairy were not answered.

At the late-June public hearing, most of the people who live near the dairy spoke against the expansion. According to Jacob, the only people in favor of the expansion were Ted Miller employees and the dairy's lawyer.

"There's really nobody here who is anti-dairy, saying CAFOs should be eliminated," Jacob said. "They're for people making money. People need to make money, but they need to do things in a manner that's legal, and in a manner that's going to make a sustainable industry."

Almost all of the people interviewed for this story agree on one thing: Idaho needs its dairies. The majority make their living from agriculture and are adamant about the fact that most operators do a good job raising their animals and working with neighbors.

Ballard Farms is one such operator. It holds roughly 85 cows and milks 60 to 70. Because the cows are kept in an open lot, or corral, it's classified as a CAFO. Because of its small herd size, Ballard Farms doesn't have a major lagoon system for cow waste. Instead, it composts manure during the summer and fall.

"Everyone I talk to in the dairy industry tries to do the right things," said Steve Ballard. "We try to talk to our neighbors and make sure everything is going well with them, that we're not a nuisance to them."

Ballard said that if his irrigation equipment sprays the dirt road the farm shares with a neighbor, creating ruts, he will come back and grade the road.

Meanwhile, many of Ted Miller Dairy's neighbors have had to spend $5,000 to $8,000 to re-drill wells because of the growing water use, Jacob said.

His family has felt the impact of living close to so many CAFOs more personally and profoundly. But moving away from a CAFO is a complicated and money-losing proposition. CAFOs and their smell, dust, noise and flies are hell on property values. Moving often means taking a huge financial hit, one many can't afford.

Johnstone Road in Owyhee County is almost as rocky as the mountains that serve as its backdrop. Countless tankers and trucks have taken their toll. Half-ruined county roads, beat up by the constant and heavy traffic moving animals and waste, are a reality of living near CAFOs.

When I find Helen Kettle, she's trimming the branches of trees that line the dirt path from Johnstone to her farm. A retired EMT, Kettle's face shows the years she's spent under the sun riding horses and working her farm.

"I thought I'd be here forever," she said later as we walked out toward the property line she shares with Wilke Feedlot, a 9,000-head heifer-replacement CAFO. Kettle and her then-husband bought the land in 1979 and built the house where she lives in 1983.

A berm separates Kettle's property from Wilke. Whether the pile of dirt, manure and rocks constitutes a berm has been a contentious source of debate and bureaucratic wrangling for years. On top of the berm sit two porcelain toilets left by the CAFO's owner. They are not Duchamp art-school odes.

Just over the barbed-wire fence and dirt berm are the cows, hundreds of them. Like in the CAFOs from the Shit Tour, manure is stacked nearly 10 feet high. The piles--"cow condos" in the vernacular--are so large that some heifers lay on them, sunning themselves.

For more than four years, Kettle has tried to sell her place after a series of incidents with the Wilke CAFO. After Wilke's water and manure flooded her property in 2005, a conditional use permit issued by Owyhee County required Wilke to build an engineered berm to divert waste water from the property line.

The nature of the thing that sits along the fence line is debatable. It's essentially a long pile of dirt and gravel meant to keep water from running 20 feet from the cow pens onto Kettle's property. Whether an engineer designed the berm is also debatable.

Then there are the toilets. They appeared after Kettle complained to Southwest District Health that Wilke employees had been hopping the berm and defecating on her property.

According to both Kettle and Alma Hasse, when the two were walking along the fence and taking pictures of the toilets, the owner harassed them and threatened to take Hasse's camera from her. Both women left shaken.

"You think of the word 'neighbor,' the term makes you think friendly or caring about another human being," Kettle said. "This is certainly not them, and I wouldn't call them neighbors."

When asked via e-mail about the toilets, berm and relationship with the farm's neighbors, a Wilke representative, who repeatedly declined to be named, sent this two-sentence statement:

"The berm is approved, meets required government specifications and has never failed, and any claims otherwise are incorrect. We adhere to, and are in

compliance with, all State and Federal mandates and strict environmental regulations."

The representative did not answer questions about the toilets.

After the 2005 discharge, Kettle said Wilke paid her $6,000 for a new well pump and trees to plant along the property line. Wilke was also fined $5,000 by ISDA, but only paid $500 of the fine; the rest was held in abeyance, to be levied in the future if necessary. Oakey said that holding the majority of fines in abeyance is "not an uncommon practice."

"Paying a fine doesn't do anything to protect the neighbor from future discharges," said Oakey. "But if there's $4,500 in looming penalty money ... they tend to get done."

While that may be true, in Kettle's case, there's the issue of the berm. It needed to be installed by Dec. 31, 2005, by NRCS standards and approved by ISDA. On the day that I visited Kettle in early July, neither of these things had been done. Two weeks later, when I spoke with ISDA officials, the berm had been approved, even though there was never any evidence of engineering documents.

Why did it take five years for ISDA to approve the berm while holding the vast majority of Wilke's fine in abeyance?

"I don't have a good answer for that," said Marv Patton, the chief of the ISDA Dairy and Egg bureau. "I think there was some confusion."

Back in Jerome County, the Dimonds are still waiting to see if they'll be living next to a CAFO. If South View is built, the Dimonds aren't sure if they'll be able to stay in their home of 12 years.

"I just don't think I'd want to live in this house," he said, sitting at the kitchen table, a glass pitcher of pink lemonade his wife Eden just made in front of him, untouched. "I know it's not huge and fancy, but it's ours."

In the other room, a boy, maybe 3 or 4 years old, wakes up from a nap on the couch. He's their youngest and was born premature. The Dimond's pediatrician told them that they can't live next to something like a CAFO. His lungs couldn't handle it.

"If it goes in," said Eden with a sigh, "nobody would want to buy our house. But we couldn't live here."

*CORRECTION: The C Bar M dairy began operations in 1980, not 1996, as the story previously reported. It changed its name to the Ted Miller Dairy in 2003.

Related Stories

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Mail and Commentary September 15, 2010
"The same gang that wrecked the whole world's economy and involved us in hopeless wars want back in."

Mail and Commentary Sept. 8, 2010
Quote of the Week: "I also find this article repulsive and filled with lies."

Note: I Know You Are, But What Am I?
Looking at this week's main feature, it looks like it'll be an encore of last week's debate/name-calling in the comments section come Wednesday.
by Rachael Daigle

BW took a shit tour. Then wrote about it.
This is the week we're going to get serious about shit. Animal shit, specifically.
by Rachael Daigle

COMMENTS (22)

Jeez..you didn't have to go to Magic Valley to take the shit tour, just go to Happy Valley and Greenhurst on a nice summer evening. Welcome to Stinky Town (Nampa).

May 26, 2016

James & Susan Ferguson
1611 Federal Heights Drive
Salt Lake City, Utah 84103
drjimferguson@yahoo.com

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear James & Susan Ferguson:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali

formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhā'ulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhā'ulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Po'ipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhā'ulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawai'i Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhā'ulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhā'ulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of

groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhāʻulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kauaʻi community.

Regional Water Demand: The adjacent, developed Kōloa-Poʻipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kauaʻi will increase county-wide by 17,300 residents by 2030. The South Kauaʻi population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kauaʻi region (the Kōloa - Poʻipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhāʻulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhāʻulepū watershed.

The HDF site is located on the bottom-land of the upper Māhāʻulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Haʻupu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhāʻulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built

facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kauaʻi Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhāʻulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhāʻulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhāʻulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to

create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Poʻipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the

Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kauaʻi community.

AIR QUALITY: As a part of the Environmental Impact Statement (EIS), existing air quality conditions and project impacts were evaluated, including dust and odor. Potential odors and emission levels for air pollutants relevant to dairy operations were modeled, as currently there are no cows on site. EIS sections 4.19 and 4.25 provide an evaluation of air quality and odors, including a windrose depicting wind speed and direction in the area (see DEIS Section 4.1, Climate). The full air quality technical report can be found in Draft EIS Appendix I.

Clean Air Act

Under the *Clean Air Act of 1970* (CAA), amended November 1990, the U.S. Environmental Protection Agency (EPA) regulates both large and small sources of air pollutants by establishing National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. The State of Hawaiʻi has established its own *State Ambient Air Quality Standards* (SAAQS) that are as strict or, in some cases more strict than the NAAQS. State standards prohibit any visible emissions of fugitive dust from construction activities at the property line.

Emissions relevant to livestock operation include particulate matter and fugitive dust. Greenhouse gases related to dairy cows include methane (CH_4) from enteric fermentation, and both methane and nitrous oxide (N_20) emissions from manure application. No State or Federal regulations for greenhouse gas emissions from farm operations or small businesses currently exist.

DUST

Dust will be generated as cows move along soft limestone walkways that connect the paddocks and lead to and from the milking parlor. Potential fugitive dust emission rates were estimated from published literature, where particulate matter (PM) is measurable from the "drylots" of confined dairy operations where animals walk over dirt and dried manure throughout the day.

Applying the emission rates from this available literature greatly overestimates potential emission resulting from HDF. Cows in the pastoral rotational-grazing system will be on pasture 22 hours each day and will spend two hours – in two separate milking cycles –moving to and from the barn for the 10- to 15-minute milking sessions.

Using atmospheric dispersion modeling system (AERMOD), the rates were scaled to the size of the non-pasture areas used by cows at HDF. Results were added to the background concentration of particulate matter (both PM_{10} and $PM_{2.5}$) measured on the island of Kaua'i, and the total concentration was compared to the State ambient air quality standards. Only the contemplated herd size of up to 2,000 mature dairy cows was modeled, as at the lower threshold of 699 cows, the potential fugitive dust impact would be negligible. The estimated concentration for PM_{10} is 2.01 $\mu g/m^3$, well below the State standard of 150 $\mu g/m^3$. The estimated concentration for $PM_{2.5}$ is 0.23 $\mu g/m^3$, well below the Federal standard of 35 $\mu g/m^3$ (see Draft EIS Section 4.19 and Table 4-19.2).

ODOR

Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF, so air dispersion models were used to determine potential odor levels. Local weather data was used in conjunction with the AERMOD modeling system, and published rates for manure odors emissions for dairy heifers and effluent ponds were adapted to reflect the HDF facilities.

Odor emission sources identified for modeling at HDF were manure in the pasture fields, irrigation water containing diluted nutrients from effluent, the effluent storage ponds, and the dairy buildings. Odor rates from published research were applied. Odor isopleths (a line used to map all points having the same numerical value) were created to display the model findings. Odor is described in "odor units" at the threshold of perception, which is defined by the point at which 50 percent of panelists, in laboratory conditions, cannot smell the odor but 50 percent of the panelists can detect the odor.

Modeling results were generated for worst case meteorological conditions (low wind velocity / mixing). Generally, tradewinds will disperse odors to less than detectable levels beyond the HDF site; in periods of no wind, odor may not be dispersed creating the "worst case" scenario. In these periods without normal tradewind flow, the odor plume would extend to the south of the HDF site. Sections 4.19.2 and 4.25.2 of the EIS include graphics of the potential odor isopleths.

Results for the committed herd size of 699 mature dairy cows show that odors may be detectable by 50 percent of the sensitive population once per 200 hours, or 44 hours per year, within an area that extends approximately 1,670-feet (within one-third of a mile) beyond the dairy farm boundary, and does not reach recreational or residential areas. Results for the contemplated expanded herd size of up to 2,000 mature dairy cows show odors would not extend beyond 2,780 feet outside the HDF boundary (just over half a mile), again not reaching recreational or residential areas, and again with detection limited to 50 percent of the sensitive population approximately 44 hours per year. The parameters used in the analysis were intentionally conservative, and the impacts shown assume an unlikely confluence of worst-case meteorological data, irrigation location, and grazing location. Actual offsite odor impacts are likely to be much lower and/or less frequent than shown; it is likely odor detection beyond the HDF boundaries will be less frequent.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

RECEIVED

FEB 27 2015

GROUP 70 INTL

Collin Fleming & Kim Factor
15197 Thayer Rd.
Oregon City, OR 97045
February 23, 2015

Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, HI 96813

Group 70 International, Inc.

As long-time owners of a rental condo in Poipu, Kauai we are very concerned about the proposed Hawai'i Dairy Farm in Māhā'ulepu Valley. This type of operation is not compatible with the condos, homes, hotels or environment of the Poipu area. A dairy of this size, this close to a developed area, will inevitably have a negative economic impact on us, our neighbors and surrounding businesses. We and our guests enjoy the many outdoor activities in the Māhā'ulepu area. Why would our guests want to go to a beach near a dairy operation? Why would people come to a resort with a major dairy operation nearby? They won't, and with the wide use of social media, word will spread that Poipu is now a less desirable destination. We will lose money – will the dairy compensate our losses and how would we prove that impact? It will also have an environmental impact on the Māhā'ulepu Valley waterways, groundwater, beaches and ocean. Even the best farming practices cannot make a dairy operation of the proposed size into a benign project. There are countless examples of dairy farms polluting their nearby environments through runoff, air-born smells and leaching. A commercial operation would also bring increased truck traffic. The EIS must take all these factors into consideration. This is the wrong site for such a project. Please stop this disastrous project for the good of all Kauai.

Sincerely,

Collin Fleming & Kim Factor

GROUP 70
INTERNATIONAL

May 26, 2016

Collin Fleming & Kim Factor
15197 Thayer Road
Oregon City, OR 97045

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Collin Fleming & Kim Factor:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

DAIRY OPERATIONS: Hawai'i Dairy Farms (HDF) will establish and operate a sustainable, pastoral rotational-grazing dairy farm in Māhā'ulepū Valley on the island of Kaua'i to produce fresh, locally available nutritious milk for Hawai'i families. The rotational-grazing method utilizes 100 percent of the cows' manure as natural fertilizer to grow pasture grass as a primary source of nutrition for dairy cows. This cost-effective method will reduce reliance on imported fertilizer and feed. Pasture grass will comprise at least 70 percent of the animals' diet. As a part of the Draft Environmental Impact Statement (EIS), the proposed facilities and operations for the dairy farm are described in Chapter 3.

The Environmental Impact Statement (EIS) Preparation Notice (EISPN), published January 23, 2015, described the proposed pasture-based rotational grazing system as a "zero-discharge, grass-fed dairy". The term "zero-discharge" under the U.S.

Environmental Protection Agency related to concentrated feeding operations (CAFO) is a system designed to not discharge pollutants into waters of the United States. As noted previously, the HDF system is designed to utilize 100 percent of the cows' manure on-site. However, nutrients would be introduced to the HDF site with any use; the Draft EIS identifies the amount of nutrients anticipated from the proposed dairy operations that could pass through to ground and surface waters. Therefore, HDF elected to discontinue use of the term "zero discharge" as it was construed as no nutrients into the system.

The term "grass-fed" was used in the HDF EISPN. This term was used to identify HDF's intent to utilize a locally-produced feedstock – grass – for more than 70 percent of the dairy herds' diet. In January 2016, the U.S. Department of Agricultural (USDA) Marketing Survey created a narrow legal definition of "grass-fed". The USDA standard defines what animals can and cannot be fed. The Food Alliance, a project of several northwest colleges, believes that when consumers choose grass-fed products there is an expectation that these will come from animals raised on pasture on a forage-based diet. Due to the evolving definition of "grass-fed", the term in not used in this EIS.

The dairy facilities will occupy an area of approximately 10 acres on the western boundary of the site. The developed area "footprint" will be less than 2 percent of the total farm area. Four buildings will be constructed to serve different functions, supported by utilities and infrastructure. Additional building information can be found in Draft EIS Section 3.3.1.

Agricultural infrastructure and utilities required for the dairy operations will include storage tanks and silos, effluent storage ponds, livestock water systems, and drainage improvements. The irrigation system and distribution of livestock water are discussed in Draft EIS Section 3.5, Pasture Management.

The pastoral rotational-grazing dairy provides a local feedstock – grass – as the herd's primary food source. Reducing imported feed stabilizes costs and provides a food source closer to the natural diet of cows. Results of grass trials initially conducted at five sites across four Hawaiian Islands were instrumental in identifying appropriate varieties of grass, and suitable sites to support sufficient "dry matter" grass yields essential to a cow's diet. Additional project-specific trials at the Māhāʻulepū site on Kauai have been conducted for more than 18 months. The results have identified sufficient yield and nutrition to supply 70 percent of the cows' diet; improvements in grass productivity are anticipated to provide up to 85 percent of cows' diet.

The pasture-based model allows cows to move about freely, and to lie down and rest, which is part of the digestion cycle. The animals are managed in social groups known as "mobs", mimicking the natural social order of bovines. Cows spend 22 hours of each 24-hour period foraging on pasture or resting, outdoors in natural light and fresh air. The gently sloped paddocks, walkways and races minimize the energy expended by the mature dairy cows as they graze or are transferred to and from the various paddocks and the mature dairy facility; surfaces of the walkways and cow races are designed to provide a comfortable path under hoof. The

management practices and pasture model applied by HDF maximizes grass as the cows' primary nutrition source and minimizes stress to the animals. Cows tend to be healthier and live longer, productive lives with access to fresh air, high quality feed, and exercise while they forage.

The 470 acres of pasture will be divided into paddocks averaging 3 to 5 acres in size. Smaller paddocks located near the dairy facility will be used as temporary pasture for cows or calves being moved on or off the farm. To protect the water quality of surface water and downstream areas, paddock fences are set back 35 feet from the edge of drainage ways throughout the site. Existing vegetation within the setbacks will be managed or restored to reduce erosion, improve stability of ditch banks, increase net carbon storage, and improve and maintain water quality.

The majority of the pastures will be irrigated with non-potable water and/or diluted effluent through either the pivot irrigation systems or through gun irrigators. Irrigation water supply is provided to the farm from Waita Reservoir, and will be filtered and pumped to the various irrigation components on the farm. The irrigation system is controlled using computer software and GPS receivers to allow very precise application of irrigation and/or diluted effluent on the pasture. The pivots can rotate and apply irrigation water and/or diluted effluent at different rates depending on the actual irrigation needs of the farm.

NRCS provides technical guidance on applying agricultural waste depending on the desired use of the waste. Reflected in the title of the livestock waste guidance for Hawaiʻi is the parenthetical inclusion of the word "nutrients." Where waste is utilized as a resource, it is being used for the constituent components that provide benefit.

The NRCS Conservation Practice Standard 590, Nutrient Management, applies to commercial fertilizers, organic by-products, waste water, organic matter, and irrigation water. Nutrient management is the practice of managing the amount, rate, source, method of application, and timing of plant nutrients and soil amendments. The timing and application of nutrients will correspond with plant uptake, soil properties and weather conditions. For more information on nutrient balance management see Draft EIS Section 3.5.3, and Draft EIS Appendix D.

The effluent storage ponds are sized to accommodate 30 days of storage for up to 2,000 mature dairy cows, and over 85 days of storage for 699 mature dairy cows. It will be highly unlikely that the storage pond will be full at any time for the contemplated 2,000-cow dairy, and nearly impossible for the committed 699-cow dairy. Throughout the less than 30-day storage period, effluent is planned for application every four days, and the slurry application is expected at least once every 45 days, to ensure that the ponds are kept at manageable levels.

Cows lactate milk following the birth of calves. Newborn calves will be housed on the Māhāʻulepū site and provided essential colostrum and nutrients for a healthy start. During the calves' initial 90 days, they will be transitioned to pasture at HDF before transfer to ranches on Kauaʻi to be raised off-site. The committed herd size of 699 mature dairy cows at the Māhāʻulepū site applies to mature mature dairy cows.

Animals in various stages of lactation and rest will be transferred between HDF and other partner ranches as needed for animal health and dairy productivity. This will benefit both the dairy and infuse the beef market in Hawai'i with a new, local source of pasture-raised calves. Male calves will become part of the beef cattle herd; heifers (young female calves that haven't given birth) will be raised until ready to return to the HDF herd as a birthing/mature dairy cow. For more information on off-site herd management, refer to Section 3.7 of the Draft EIS.

Health of the herd is of primary importance as the success of a dairy relies on cows effectively producing quality milk. All cows will be treated with a high standard of care. Dairy managers and caretakers will be trained and competent in handling animals to minimize stress and ensure the herds' welfare. A licensed veterinarian may prescribe use of antibiotics approved by the Food & Drug Administration (FDA) for treatment of illnesses. Adherence to guidelines that prohibit milk from cows undergoing antibiotic treatment will ensure no adulteration of milk. Routine laboratory tests of milk for traces of antibiotic residue will be conducted. HDF will not inject cows with bovine growth hormone, referred to as rBST or rBGH.

DEMOGRAPHIC AND ECONOMIC: The potential impacts of Hawai'i Dairy Farms (HDF) to the existing economy were evaluated in the Draft Environmental Impact Statement (EIS), including a fiscal impact assessment report completed in April, 2016 by Plasch Economics Pacific. Draft EIS Section 4.15 addresses demographic and economic factors, with the complete report in Appendix J.

The HDF project would create short-term benefits through jobs for local construction personnel and local material suppliers. Such jobs would include equipment operators, cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, supervisors, painters, etc. Based on State employment multipliers, indirect employment related to Dairy construction would be expected to average about 16 jobs on Kaua'i, and 8 on O'ahu. Construction employment would be expected to average about 12 jobs per year during the development period. Thus direct-plus-indirect employment association with construction would be expected to average approximately 36 jobs, of which 28 would be on Kaua'i.

The HDF project would contribute to diversification of Kaua'i's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Hawai'i Island), approximately10 percent of Hawai'i's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and indirect full-time equivalent jobs on Kaua'i, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on O'ahu.

HDF is expected to generate a net income of approximately $68,000 to the County when the 699 cow herd is established. When the dairy has matured to full production for the 699 cow dairy, net income to the State is calculated at $160,000

annually. With the potential contemplated herd size of up to 2,000 mature dairy cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be produced. This would double local milk production currently supplied by operational dairies on the Island of Hawai'i.

Additional employment generated by a possible expansion to accommodate the contemplated 2,000 mature dairy cow herd is estimated at approximately 3 construction jobs plus 4 indirect jobs on Kaua'i, and 2 indirect jobs on O'ahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an additional 5 full-time farm jobs would be added, with approximately 15 additional indirect jobs on Kaua'i and another 8 indirect jobs on O'ahu.

The dairy is expected to generate a net additional contribution to the County of approximately $8,000 for improvements related to expansion for the contemplated herd size of up to 2,000 mature dairy cows ($76,000 total versus $68,000 for the committed herd size). The State will derive approximately $360,000 annually in revenues from the contemplated 2,000-mature dairy cow dairy.

Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhā'ulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The

aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhāʻulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Poʻipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhāʻulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawaiʻi Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhāʻulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhāʻulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhāʻulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water

quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kauaʻi community.

Regional Water Demand: The adjacent, developed Kōloa-Poʻipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kauaʻi will increase county-wide by 17,300 residents by 2030. The South Kauaʻi population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kauaʻi region (the Kōloa - Poʻipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhāʻulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhāʻulepū watershed.

The HDF site is located on the bottom-land of the upper Māhāʻulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Haʻupu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhāʻulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kauaʻi Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi

Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhāʻulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhāʻulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhāʻulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural

fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Poʻipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water

masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kaua'i community.

TRAFFIC: The Draft Environmental Impact Statement (EIS) Section 4.18 and 4.25 includes an evaluation of roadways and traffic conditions, along with potential impacts of the dairy farm construction and operation. Primary access to the site is via Māhā'ulepū Road, a two-way, two-lane road, which is accessible from Kōloa Road (Highway 530) via Ala Kinoiki Road. Within the project area, there is a network of unimproved private agriculture haul roads that provide access to and from Māhā'ulepū Road.

Roadways in the project area operate smoothly with no periods of heavy traffic. On average, traffic in the region is much lower than urban areas in the state due to the low population of Kaua'i and rural agricultural demographics of the south Kaua'i area and Māhā'ulepū. Traffic on Māhā'ulepū Road consists of agricultural vehicles, residential and resort visitor traffic.

During construction, the proposed project is not expected to have a significant short term impact on traffic operations in the project vicinity. Additional traffic will be generated during construction, but will return to normal levels after project completion during day-to-day operations. There will be no change to traffic patterns or infrastructure related to the public roads.

Traffic operations along Māhā'ulepū Road and the surrounding County roads are expected to continue to operate at acceptable levels of service during peak hours of traffic. The projected increase in vehicle movements related to HDF operations for the committed herd size of 699 cows would include 5 daily employees accessing the site, milk tanker and supply trucks every two days, and truck with stock trailer, for a total of 12 additional vehicle trips per day. Daily traffic along Ala Kinoiki Road and Kōloa Road was 8,000 and 6,500 cars daily; HDF-related traffic would add less than one percent additional trips. These additional trips would have a minimal effect on traffic conditions at County roadways in the surrounding area.

At a contemplated herd size of up to 2,000 cows, an additional 11 vehicle trips per day would access the HDF site, for a total of 23 vehicle trips daily. Projections for daily vehicle movements in 2035 for Ala Kinoiki Road and Kōloa Road are 7,200 and 9,500 daily vehicles. HDF-related traffic would add less than one percent. These additional trips would have a minimal effect on traffic conditions at County

roadways in the surrounding area. Traffic data is presented in the Draft EIS Sections 4.18 and 4.24.

Construction equipment mobilization will comply with Hawai'i Department of Transportation and County requirements. Delivery trucks and milk tanker trucks will be in compliance with State and County size and weight limits; no oversized vehicles will be used for ongoing operations.

AIR QUALITY: As a part of the Environmental Impact Statement (EIS), existing air quality conditions and project impacts were evaluated, including dust and odor. Potential odors and emission levels for air pollutants relevant to dairy operations were modeled, as currently there are no cows on site. EIS sections 4.19 and 4.25 provide an evaluation of air quality and odors, including a windrose depicting wind speed and direction in the area (see DEIS Section 4.1, Climate). The full air quality technical report can be found in Draft EIS Appendix I.

Clean Air Act

Under the *Clean Air Act of 1970* (CAA), amended November 1990, the U.S. Environmental Protection Agency (EPA) regulates both large and small sources of air pollutants by establishing National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. The State of Hawai'i has established its own *State Ambient Air Quality Standards* (SAAQS) that are as strict or, in some cases more strict than the NAAQS. State standards prohibit any visible emissions of fugitive dust from construction activities at the property line.

Emissions relevant to livestock operation include particulate matter and fugitive dust. Greenhouse gases related to dairy cows include methane (CH_4) from enteric fermentation, and both methane and nitrous oxide (N_20) emissions from manure application. No State or Federal regulations for greenhouse gas emissions from farm operations or small businesses currently exist.

DUST

Dust will be generated as cows move along soft limestone walkways that connect the paddocks and lead to and from the milking parlor. Potential fugitive dust emission rates were estimated from published literature, where particulate matter (PM) is measurable from the "drylots" of confined dairy operations where animals walk over dirt and dried manure throughout the day.

Applying the emission rates from this available literature greatly overestimates potential emission resulting from HDF. Cows in the pastoral rotational-grazing system will be on pasture 22 hours each day and will spend two hours – in two separate milking cycles –moving to and from the barn for the 10- to 15-minute milking sessions.

Using atmospheric dispersion modeling system (AERMOD), the rates were scaled to the size of the non-pasture areas used by cows at HDF. Results were added to the background concentration of particulate matter (both PM_{10} and $PM_{2.5}$) measured on the island of Kaua'i, and the total concentration was compared to the State ambient

air quality standards. Only the contemplated herd size of up to 2,000 mature dairy cows was modeled, as at the lower threshold of 699 cows, the potential fugitive dust impact would be negligible. The estimated concentration for PM_{10} is 2.01 μg/m³, well below the State standard of 150 μg/m³. The estimated concentration for $PM_{2.5}$ is 0.23 μg/m³, well below the Federal standard of 35 μg/m³ (see Draft EIS Section 4.19 and Table 4-19.2).

ODOR

Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF, so air dispersion models were used to determine potential odor levels. Local weather data was used in conjunction with the AERMOD modeling system, and published rates for manure odors emissions for dairy heifers and effluent ponds were adapted to reflect the HDF facilities.

Odor emission sources identified for modeling at HDF were manure in the pasture fields, irrigation water containing diluted nutrients from effluent, the effluent storage ponds, and the dairy buildings. Odor rates from published research were applied. Odor isopleths (a line used to map all points having the same numerical value) were created to display the model findings. Odor is described in "odor units" at the threshold of perception, which is defined by the point at which 50 percent of panelists, in laboratory conditions, cannot smell the odor but 50 percent of the panelists can detect the odor.

Modeling results were generated for worst case meteorological conditions (low wind velocity / mixing). Generally, tradewinds will disperse odors to less than detectable levels beyond the HDF site; in periods of no wind, odor may not be dispersed creating the "worst case" scenario. In these periods without normal tradewind flow, the odor plume would extend to the south of the HDF site. Sections 4.19.2 and 4.25.2 of the EIS include graphics of the potential odor isopleths.

Results for the committed herd size of 699 mature dairy cows show that odors may be detectable by 50 percent of the sensitive population once per 200 hours, or 44 hours per year, within an area that extends approximately 1,670-feet (within one-third of a mile) beyond the dairy farm boundary, and does not reach recreational or residential areas. Results for the contemplated expanded herd size of up to 2,000 mature dairy cows show odors would not extend beyond 2,780 feet outside the HDF boundary (just over half a mile), again not reaching recreational or residential areas, and again with detection limited to 50 percent of the sensitive population approximately 44 hours per year. The parameters used in the analysis were intentionally conservative, and the impacts shown assume an unlikely confluence of worst-case meteorological data, irrigation location, and grazing location. Actual offsite odor impacts are likely to be much lower and/or less frequent than shown; it is likely odor detection beyond the HDF boundaries will be less frequent.

ALTERNATIVES: As a part of the DEIS, alternatives were evaluated that could attain the objectives of the action's purpose and need, and were compared with environmental benefits, costs, and risks of each reasonable alternative against those

of the proposed dairy project. Further discussion of alternatives can be found in DEIS Section 6.

The DEIS evaluates alternatives that could attain the objectives of the action's purpose and need, and compares environmental benefits, costs, and risks of each reasonable alternative against those of the proposed action. Additionally, reasonable land use alternatives that emerged from public input during the project scoping phase are documented and briefly discussed. The alternatives that do not meet the project purpose are not advanced for analysis of environmental benefits, costs, and risks. The Environmental Impact Statement Rules, Hawai'i Administrative Rules Chapter 11-200 (HRS 11-200) requires a discussion of alternatives that could attain the objectives of the action, regardless of cost. There is no requirement for the alternatives analysis to consider every possible land use.

Four possible land uses that would not meet the project purpose are discussed. Rezoning the land for resort or residential development, or a potential conservation condemnation are two uses that were examined and eliminated from analysis. These options would not be reasonably viable given the existing private land tenure and existing zoning. Two additional alternatives were considered as reasonable land uses as they could be permitted within the existing State Land Use Agricultural District and County Agricultural Zoning District. These options include Agricultural Park with Processing Center, and development of an Agricultural Subdivision. The alternatives were examined and eliminated from further analysis, however, as they would not fulfill the project purpose.

The analysis, therefore, focuses on alternatives that meet the project purpose. Rigorous exploration and evaluation of the environmental impacts of the alternatives, including those that might enhance environmental quality or avoid, reduce or minimize some or all of the adverse environmental effects, costs and risks. These alternatives include: (1) the development of a Conventional Feedlot Dairy (a non-pasture-based dairy) at the same location; (2) development of the Pasture-Based Dairy at an Alternative Location on Kaua'i; and (3) milk products processing by HDF. The alternative of "No Action" is also evaluated.

The alternatives analysis provides a comprehensive evaluation of the range of potential alternatives, including the two alternative development scenarios. Although the alternatives are potentially reasonable uses under existing zoning and neighboring uses, each fails to comprehensively fulfill the project requirements defined by the eight Project Objectives and the four established Evaluation Criteria (Chapter 2, Sections 2.3.3 and 2.3.4).

The essential differences as compared to the proposed action are highlighted in the following statements.

- Only one of the alternative actions (conventional feedlot alternative) would create a commercial scale dairy operation in Hawai'i, with the capability to produce 10 percent of the State's fresh milk demand thus reducing dependence on imported milk (Objective 1). This alternative, however, would not reduce reliance on costly imported fertilizer and feed (Objective 2); grow

local, quality grass as a primary feedstock (Objective 3); and would not utilize 100 percent of manure on site as nutrients to grow forage for dairy cows (Criterion 4).

- None of the alternatives would secure a dairy location that meets the requirements for a pastoral, pasture-based grazing dairy: sufficient contiguous land area; available long-term land tenure; adequate potable water supply; suitable soil properties; gentle slope conditions; and accessibility (Criterion 1).
- One alternative (Agricultural Park) could potentially generate new long-term employment in the agricultural sector on Kaua'i in a wide range of positions including pasture agronomy/soils science, environmental resources management (Criterion 2).
- The Agricultural Park alternative could also develop sustainable food production utilizing Important Agricultural Lands, demonstrating the importance of long-term agricultural leases and capital investment for agricultural infrastructure, water systems and support facilities. (Criterion 3). However, after years of trying, it appears there was limited interest in such a venture.
- Finally, addressing the range of potential environmental impacts (natural, cultural, social and economic) (Objective 8) the two alternative development scenarios would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.

In contrast to the other options considered, the planned agricultural operation of Hawai'i Dairy Farms, was determined to be the most viable option and is the preferred alternative. Of all the alternatives considered, this is the only approach that achieves project objectives and meets each of the four Evaluation Criteria.

- Hawai'i Dairy Farms will create a commercial scale pasture-based dairy operation in Hawai'i, with the capability to provide more than 1,000,000 gallons of the fresh milk demand, reducing dependence on imported milk (Objective 1).
- The planned dairy location meets the requirements of minimum land area, soil properties, slope conditions, water supply, land tenure and availability, and accessibility (Criterion 1).
- The planned action will generate new long-term employment in the agricultural sector on Kaua'i, including pasture agronomy/soils science, veterinary and animal husbandry, environmental resources management, milk/milk processing, and dairy business management (Criterion 2).
- Sustainable food production utilizing Important Agricultural Lands (Criterion 3) will occur with the proposed action, demonstrating the importance of long term agricultural leases, and the ability to draw capital investment for agricultural infrastructure including water systems and support facilities (Criterion 3).

- Address the range of potential environmental impacts by utilizing 100 percent of manure as natural fertilizer to grow the majority of food for cows (Criterion 4). The alternatives evaluated would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.
- Creating an economically viable pasture rotational-grazing model maintains agriculture, retains open space, and provides buffer between highly utilized resort and residential development and sensitive natural or cultural resources (Objective 8).

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

RECEIVED

FEB 23 2015

GROUP 70 INTL

RESPONSE TO HAWAII DAIRY FARM'S ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE

Dear Sir, Ma'am,

It is a very bad idea to have an Industrial Dairy at Maha'ulepu Valley. The imminent damage to this unique pristine island physically, culturally, and economically cannot help but will be disastrous and irreversible. Although I support farming and small dairy farms on the island, I do not support an Industrial Diary with unprecedented number of cows per grazing acre in a culturally sensitive, unique and beautiful Oceanside Valley.

It is also my understanding that neither Grove Farm nor the State Department of Health are willing to post a sign warning families of small children about the known bacterial content in the stream coming from the proposed HDF farm site that emerges near the mouth of the cave and forms a fresh water pool on the soft sandy beach at Maha'ulepu. That warm pool with the stream running through it to the ocean is a favorite playground for island children and visitors. I consider that to be egregiously irresponsible by these stewards of our island.

In my reading of the EISPN, it does not, but should include a detailed study of the known pollution levels with identification of causes and methods to eradicate. No further development should proceed until HDF can prove to the public that the contamination has been eliminated and will not recur with any activity they propose. If they are not able to do this with any degree of scientific proof (not unsubstantiated promises), then Grove Farm and HDF must be directed by our Department of Health to relocate HDF proposed animal feed operation to a safer environmental location without the obvious risks occurring at Mahaulepu. Please consider other more isolated locations for the sake of all Kauaians.

The watershed and hydrologic drainage from the proposed farm site, both above and below ground must be thoroughly assessed by an environmental engineering firm. Nothing less should be acceptable by HDF or the Department of Health. I will anxiously await and watch for the results of that study.

The threat of this dairy farm polluting, the streams, the ocean/beaches along the south shore, our three water wells is very real. The Manure in the water, with the direction of the wind and ocean stream, will be trapped in the Children's Swimming Area of Poipu Beach Park (the best toddler ocean pool in Hawaii which is part of our Famous Poipu Beach, voted the # 1 beach in the United States and always in the top ten beaches). The EIS must include a detailed study of the probable massive fly population that will develop in the warm moist climate in Mahal'lepu and show proof that the fly population can be sufficiently abated to ensure visitors to Mahalulepu and the south shore will not be sickened from bites from these flies.

(over)

As any entomologist will confirm, one fly lays a minimum of 300 eggs and they prefer warm wet manure. The types that develop in manure are horn flies, stable flies, deer flies and horseflies; all piercing sucking flies that exist on blood. Our frequent rains will greatly increase the proliferation and these insects can fly up to 4 miles from the HDF site. Within a few months, there will be billions of files. The EIS must offer proof that this will not happen. Please hire the best environmental entomologist available for your study. We also need to know the facts as to how the HDF will control run off. Gravity operates at even a small pitch (especially over clay soil) and this land is only 65 feet above sea level. Although the proposed sloping the land to the ditches could encourage control of the run off, you are really just passing it to the Waipili stream which runs to the ocean. In a few years it will have polluted all the beaches along the south shore. In addition, how you will reduce the Nitrates in the water and the methane gas contribution to our fragile Ozone layer.

The overall probable long-term impact of allowing HDF to go into production is as follows:

- There will be no more eating on our lanais, thriving outdoor restaurants or picnics on the beach.
- Bankruptcy of restaurants, businesses and condos will follow.
- Unemployment will be rampant as the economy of the entire island gradually dies from loss of jobs related to the loss of our profitable Visitor Industry.

In return HDF will provide maybe a dozen "filthy jobs". Certainly that is not an acceptable trade off.

As I stated earlier, HDF is a bad idea for the proposed Maha'ulepu location and I'm an objectively conducted EIS will bear that out.

Sincerely,

Karl Forer
1939 Haelukana St.
Lihue, HI 96766

May 26, 2016

Karl Forer
1939 Haelukana Street
Lihue, HI 96766

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Karl Forer:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

DAIRY OPERATIONS: Hawai'i Dairy Farms (HDF) will establish and operate a sustainable, pastoral rotational-grazing dairy farm in Māhā'ulepū Valley on the island of Kaua'i to produce fresh, locally available nutritious milk for Hawai'i families. The rotational-grazing method utilizes 100 percent of the cows' manure as natural fertilizer to grow pasture grass as a primary source of nutrition for dairy cows. This cost-effective method will reduce reliance on imported fertilizer and feed. Pasture grass will comprise at least 70 percent of the animals' diet. As a part of the Draft Environmental Impact Statement (EIS), the proposed facilities and operations for the dairy farm are described in Chapter 3.

The Environmental Impact Statement (EIS) Preparation Notice (EISPN), published January 23, 2015, described the proposed pasture-based rotational grazing system as a "zero-discharge, grass-fed dairy". The term "zero-discharge" under the U.S. Environmental Protection Agency related to concentrated feeding operations

(CAFO) is a system designed to not discharge pollutants into waters of the United States. As noted previously, the HDF system is designed to utilize 100 percent of the cows' manure on-site. However, nutrients would be introduced to the HDF site with any use; the Draft EIS identifies the amount of nutrients anticipated from the proposed dairy operations that could pass through to ground and surface waters. Therefore, HDF elected to discontinue use of the term "zero discharge" as it was construed as no nutrients into the system.

The term "grass-fed" was used in the HDF EISPN. This term was used to identify HDF's intent to utilize a locally-produced feedstock – grass – for more than 70 percent of the dairy herds' diet. In January 2016, the U.S. Department of Agricultural (USDA) Marketing Survey created a narrow legal definition of "grass-fed". The USDA standard defines what animals can and cannot be fed. The Food Alliance, a project of several northwest colleges, believes that when consumers choose grass-fed products there is an expectation that these will come from animals raised on pasture on a forage-based diet. Due to the evolving definition of "grass-fed", the term in not used in this EIS.

The dairy facilities will occupy an area of approximately 10 acres on the western boundary of the site. The developed area "footprint" will be less than 2 percent of the total farm area. Four buildings will be constructed to serve different functions, supported by utilities and infrastructure. Additional building information can be found in Draft EIS Section 3.3.1.

Agricultural infrastructure and utilities required for the dairy operations will include storage tanks and silos, effluent storage ponds, livestock water systems, and drainage improvements. The irrigation system and distribution of livestock water are discussed in Draft EIS Section 3.5, Pasture Management.

The pastoral rotational-grazing dairy provides a local feedstock – grass – as the herd's primary food source. Reducing imported feed stabilizes costs and provides a food source closer to the natural diet of cows. Results of grass trials initially conducted at five sites across four Hawaiian Islands were instrumental in identifying appropriate varieties of grass, and suitable sites to support sufficient "dry matter" grass yields essential to a cow's diet. Additional project-specific trials at the Māhā'ulepū site on Kauai have been conducted for more than 18 months. The results have identified sufficient yield and nutrition to supply 70 percent of the cows' diet; improvements in grass productivity are anticipated to provide up to 85 percent of cows' diet.

The pasture-based model allows cows to move about freely, and to lie down and rest, which is part of the digestion cycle. The animals are managed in social groups known as "mobs", mimicking the natural social order of bovines. Cows spend 22 hours of each 24-hour period foraging on pasture or resting, outdoors in natural light and fresh air. The gently sloped paddocks, walkways and races minimize the energy expended by the mature dairy cows as they graze or are transferred to and from the various paddocks and the mature dairy facility; surfaces of the walkways and cow races are designed to provide a comfortable path under hoof. The management practices and pasture model applied by HDF maximizes grass as the cows' primary nutrition source and minimizes stress to the animals. Cows tend to be

healthier and live longer, productive lives with access to fresh air, high quality feed, and exercise while they forage.

The 470 acres of pasture will be divided into paddocks averaging 3 to 5 acres in size. Smaller paddocks located near the dairy facility will be used as temporary pasture for cows or calves being moved on or off the farm. To protect the water quality of surface water and downstream areas, paddock fences are set back 35 feet from the edge of drainage ways throughout the site. Existing vegetation within the setbacks will be managed or restored to reduce erosion, improve stability of ditch banks, increase net carbon storage, and improve and maintain water quality.

The majority of the pastures will be irrigated with non-potable water and/or diluted effluent through either the pivot irrigation systems or through gun irrigators. Irrigation water supply is provided to the farm from Waita Reservoir, and will be filtered and pumped to the various irrigation components on the farm. The irrigation system is controlled using computer software and GPS receivers to allow very precise application of irrigation and/or diluted effluent on the pasture. The pivots can rotate and apply irrigation water and/or diluted effluent at different rates depending on the actual irrigation needs of the farm.

NRCS provides technical guidance on applying agricultural waste depending on the desired use of the waste. Reflected in the title of the livestock waste guidance for Hawai‘i is the parenthetical inclusion of the word “nutrients.” Where waste is utilized as a resource, it is being used for the constituent components that provide benefit.

The NRCS Conservation Practice Standard 590, Nutrient Management, applies to commercial fertilizers, organic by-products, waste water, organic matter, and irrigation water. Nutrient management is the practice of managing the amount, rate, source, method of application, and timing of plant nutrients and soil amendments. The timing and application of nutrients will correspond with plant uptake, soil properties and weather conditions. For more information on nutrient balance management see Draft EIS Section 3.5.3, and Draft EIS Appendix D.

The effluent storage ponds are sized to accommodate 30 days of storage for up to 2,000 mature dairy cows, and over 85 days of storage for 699 mature dairy cows. It will be highly unlikely that the storage pond will be full at any time for the contemplated 2,000-cow dairy, and nearly impossible for the committed 699-cow dairy. Throughout the less than 30-day storage period, effluent is planned for application every four days, and the slurry application is expected at least once every 45 days, to ensure that the ponds are kept at manageable levels.

Cows lactate milk following the birth of calves. Newborn calves will be housed on the Māhā‘ulepū site and provided essential colostrum and nutrients for a healthy start. During the calves’ initial 90 days, they will be transitioned to pasture at HDF before transfer to ranches on Kaua‘i to be raised off-site. The committed herd size of 699 mature dairy cows at the Māhā‘ulepū site applies to mature mature dairy cows. Animals in various stages of lactation and rest will be transferred between HDF and other partner ranches as needed for animal health and dairy productivity. This will benefit both the dairy and infuse the beef market in Hawai‘i with a new, local source

of pasture-raised calves. Male calves will become part of the beef cattle herd; heifers (young female calves that haven’t given birth) will be raised until ready to return to the HDF herd as a birthing/mature dairy cow. For more information on off-site herd management, refer to Section 3.7 of the Draft EIS.

Health of the herd is of primary importance as the success of a dairy relies on cows effectively producing quality milk. All cows will be treated with a high standard of care. Dairy managers and caretakers will be trained and competent in handling animals to minimize stress and ensure the herds’ welfare. A licensed veterinarian may prescribe use of antibiotics approved by the Food & Drug Administration (FDA) for treatment of illnesses. Adherence to guidelines that prohibit milk from cows undergoing antibiotic treatment will ensure no adulteration of milk. Routine laboratory tests of milk for traces of antibiotic residue will be conducted. HDF will not inject cows with bovine growth hormone, referred to as rBST or rBGH.

PESTS: A study of invertebrate species and pest insects was conducted by Steven Lee Montgomery, PhD, Consulting Biologist in January 2016. The study summarizes the presence or absence of native species or pest species associated with cattle manure in the general Māhā‘ulepū area, as well as the parasites and predators that control those species. No federally or state listed endangered or threatened invertebrate species were noted in the survey of the site. A full report and list of species found on site is provided in EIS Section 4.11 and Appendix B.

Flies were identified on the HDF site using manure from neighboring livestock as bait for invertebrates. The two flies associated with livestock are the stable fly and the horn fly, the latter known for biting cattle. These flies and the greenbottle fly are often confused with the house fly. Flies known to exist on Kaua‘i but not seen at the HDF site include the house fly, the dog dung fly, and the chicken dung fly. These pests are common in areas with high pet populations. It is possible these fly species could inadvertently be brought to the dairy and utilize manure as a food source. HDF will prevent and control fly population growth through diligent clean up and sanitation practices regarding any trash and food waste, as well as through efficient manure composting practices. A full list of site management measures is provided in EIS Section 4.11. The project location does not provide any habitat for *drosophila musaphilia*, the only Kaua‘i species of native Hawaiian fly listed as Endangered or Threatened. Native Drosophila habitat is located many miles away in the high elevation koa-‘ōhi‘a forests.

Fly populations at HDF will be minimized through a process known as Integrated Pest Management (IPM). Essentially, IPM disrupts reproduction with appropriate means at key points in the pest’s life cycle. Used in Hawai‘i for decades, a number of invertebrates and a bird (the cattle egret) were introduced between 1898 and 1950 to reduce livestock-related insects. IPM utilizes knowledge of the ancient food web among species.

An especially important insect to minimize fly breeding habitat in manure is the dung beetle, which buries manure and incorporates it into the soil. Populations of dung beetles found on Kaua‘i and those species already in Māhā‘ulepū Valley, will increase with the increased manure food source, thus increasing and speeding breakdown of

manure. Dung beetles are specialists in the very important natural process of breaking up and quickly recycling bovine manure pads. The behavioral diversity among dung beetle species will work together to bury dung pats in one to three days, a shorter amount of time than the 10-30 days flies eggs need to hatch.

In the Kōloa-Po'ipū region, pest fly populations are dependent upon food and breeding sources nearby such as dog, cat, and chicken feces. Beef cattle graze in the region on agricultural lands along Ala Kinoiki Road between Kōloa and Po'ipū, and it is likely the livestock-related flies identified at the HDF site occur in this region as well. Localized controls to reduce pest populations need to address breeding sites in and amongst the food and animals wastes within the area. These mitigation measures will make it difficult for flies to breed, and BMPs will be enforced to address any increase in population, therefore it is expected that the dairy farm will not significantly affect recreational and resort areas.

DEMOGRAPHIC AND ECONOMIC: The potential impacts of Hawai'i Dairy Farms (HDF) to the existing economy were evaluated in the Draft Environmental Impact Statement (EIS), including a fiscal impact assessment report completed in April, 2016 by Plasch Economics Pacific. Draft EIS Section 4.15 addresses demographic and economic factors, with the complete report in Appendix J.

The HDF project would create short-term benefits through jobs for local construction personnel and local material suppliers. Such jobs would include equipment operators, cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, supervisors, painters, etc. Based on State employment multipliers, indirect employment related to Dairy construction would be expected to average about 16 jobs on Kaua'i, and 8 on O'ahu. Construction employment would be expected to average about 12 jobs per year during the development period. Thus direct-plus-indirect employment association with construction would be expected to average approximately 36 jobs, of which 28 would be on Kaua'i.

The HDF project would contribute to diversification of Kaua'i's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Hawai'i Island), approximately10 percent of Hawai'i's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and indirect full-time equivalent jobs on Kaua'i, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on O'ahu.

HDF is expected to generate a net income of approximately $68,000 to the County when the 699 cow herd is established. When the dairy has matured to full production for the 699 cow dairy, net income to the State is calculated at $160,000 annually. With the potential contemplated herd size of up to 2,000 mature dairy cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be

produced. This would double local milk production currently supplied by operational dairies on the Island of Hawai'i.

Additional employment generated by a possible expansion to accommodate the contemplated 2,000 mature dairy cow herd is estimated at approximately 3 construction jobs plus 4 indirect jobs on Kaua'i, and 2 indirect jobs on O'ahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an additional 5 full-time farm jobs would be added, with approximately 15 additional indirect jobs on Kaua'i and another 8 indirect jobs on O'ahu.

The dairy is expected to generate a net additional contribution to the County of approximately $8,000 for improvements related to expansion for the contemplated herd size of up to 2,000 mature dairy cows ($76,000 total versus $68,000 for the committed herd size). The State will derive approximately $360,000 annually in revenues from the contemplated 2,000-mature dairy cow dairy.

Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhā'ulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the

unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhāʻulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Poʻipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhāʻulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawaiʻi Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhāʻulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhāʻulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhāʻulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow

comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kauaʻi community.

Regional Water Demand: The adjacent, developed Kōloa-Poʻipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kauaʻi will increase county-wide by 17,300 residents by 2030. The South Kauaʻi population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kauaʻi region (the Kōloa - Poʻipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhāʻulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhāʻulepū watershed.

The HDF site is located on the bottom-land of the upper Māhāʻulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Haʻupu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhāʻulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kauaʻi Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable

to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhāʻulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhāʻulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhāʻulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and

a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Poʻipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator

bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kaua'i community.

AIR QUALITY: As a part of the Environmental Impact Statement (EIS), existing air quality conditions and project impacts were evaluated, including dust and odor. Potential odors and emission levels for air pollutants relevant to dairy operations were modeled, as currently there are no cows on site. EIS sections 4.19 and 4.25 provide an evaluation of air quality and odors, including a windrose depicting wind speed and direction in the area (see DEIS Section 4.1, Climate). The full air quality technical report can be found in Draft EIS Appendix I.

Clean Air Act

Under the *Clean Air Act of 1970* (CAA), amended November 1990, the U.S. Environmental Protection Agency (EPA) regulates both large and small sources of air pollutants by establishing National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. The State of Hawai'i has established its own *State Ambient Air Quality Standards* (SAAQS) that are as strict or, in some cases more strict than the NAAQS. State standards prohibit any visible emissions of fugitive dust from construction activities at the property line.

Emissions relevant to livestock operation include particulate matter and fugitive dust. Greenhouse gases related to dairy cows include methane (CH_4) from enteric fermentation, and both methane and nitrous oxide (N_20) emissions from manure application. No State or Federal regulations for greenhouse gas emissions from farm operations or small businesses currently exist.

DUST

Dust will be generated as cows move along soft limestone walkways that connect the paddocks and lead to and from the milking parlor. Potential fugitive dust emission rates were estimated from published literature, where particulate matter (PM) is measurable from the "drylots" of confined dairy operations where animals walk over dirt and dried manure throughout the day.

Applying the emission rates from this available literature greatly overestimates potential emission resulting from HDF. Cows in the pastoral rotational-grazing system will be on pasture 22 hours each day and will spend two hours – in two separate milking cycles –moving to and from the barn for the 10- to 15-minute milking sessions.

Using atmospheric dispersion modeling system (AERMOD), the rates were scaled to the size of the non-pasture areas used by cows at HDF. Results were added to the background concentration of particulate matter (both PM_{10} and $PM_{2.5}$) measured on the island of Kaua'i, and the total concentration was compared to the State ambient air quality standards. Only the contemplated herd size of up to 2,000 mature dairy cows was modeled, as at the lower threshold of 699 cows, the potential fugitive dust impact would be negligible. The estimated concentration for PM_{10} is 2.01 $\mu g/m^3$, well below the State standard of 150 $\mu g/m^3$. The estimated concentration for $PM_{2.5}$ is 0.23 $\mu g/m^3$, well below the Federal standard of 35 $\mu g/m^3$ (see Draft EIS Section 4.19 and Table 4-19.2).

ODOR

Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF, so air dispersion models were used to determine potential odor levels. Local weather data was used in conjunction with the AERMOD modeling system, and published rates for manure odors emissions for dairy heifers and effluent ponds were adapted to reflect the HDF facilities.

Odor emission sources identified for modeling at HDF were manure in the pasture fields, irrigation water containing diluted nutrients from effluent, the effluent storage ponds, and the dairy buildings. Odor rates from published research were applied. Odor isopleths (a line used to map all points having the same numerical value) were created to display the model findings. Odor is described in "odor units" at the threshold of perception, which is defined by the point at which 50 percent of panelists, in laboratory conditions, cannot smell the odor but 50 percent of the panelists can detect the odor.

Modeling results were generated for worst case meteorological conditions (low wind velocity / mixing). Generally, tradewinds will disperse odors to less than detectable levels beyond the HDF site; in periods of no wind, odor may not be dispersed creating the "worst case" scenario. In these periods without normal tradewind flow, the odor plume would extend to the south of the HDF site. Sections 4.19.2 and 4.25.2 of the EIS include graphics of the potential odor isopleths.

Results for the committed herd size of 699 mature dairy cows show that odors may be detectable by 50 percent of the sensitive population once per 200 hours, or 44 hours per year, within an area that extends approximately 1,670-feet (within one-third of a mile) beyond the dairy farm boundary, and does not reach recreational or residential areas. Results for the contemplated expanded herd size of up to 2,000 mature dairy cows show odors would not extend beyond 2,780 feet outside the HDF boundary (just over half a mile), again not reaching recreational or residential areas, and again with detection limited to 50 percent of the sensitive population approximately 44 hours per year. The parameters used in the analysis were intentionally conservative, and the impacts shown assume an unlikely confluence of worst-case meteorological data, irrigation location, and grazing location. Actual offsite odor impacts are likely to be much lower and/or less frequent than shown; it is likely odor detection beyond the HDF boundaries will be less frequent.

GREENHOUSE GASSES: Draft Environmental Impact Statement (EIS) Sections 4.19 and 4.26 address the potential for greenhouse gas emissions by Hawai'i Dairy Farms (HDF). Estimates of GHG emission rates from a pasture-based dairy, including methane and nitrous oxide, were calculated using the 2006 Intergovernmental Panel on Climate Change (IPCC) Guidelines for National Greenhouse Gas Inventories. Parameters for Oceanic dairy cattle in warm climates were selected as most applicable to conditions at HDF. Long-term operational impacts were modeled using the IPCC guidelines and conversions, and estimated the emissions potential for GHG at the dairy at the committed herd size of 699 milking cows to be 2,693 CO_2e metric tons per year. This equates to roughly 1.02 percent of the utility power generation sector on Kaua'i in 2013, which does not include vehicle emissions and other GHG emitters on the island.

Potential GHG emissions for HDF at the contemplated herd size of up to 2,000 milking cows was modeled as described in Section 4.19.3 using the IPCC guidelines and conversions. The estimated total of 7,702 CO_2e metric tons per year (8,490 tons) is 5,009 CO_2e metric tons (5,521 tons) greater than the committed herd size of 699 milking cows. This equates to an increase equivalent to 1.91 percent of GHG produced on Kaua'i for power generation by the utility in 2013 (KIUC, 2014). Power generation does not include vehicle emissions and other GHG emitters on the island.

While the presence of cows may increase GHG, a long-term beneficial impact of the grazing fields is the sequestration of carbon as CO_2 captured by the process of photosynthesis by the grass. According to recent studies in the Soil Science Society of America Journal, converting formerly tilled cropland to grazed pasture can drive substantial accumulation of organic carbons in soil, which enhances soil quality, grass production, and has the potential to offset up to one-third the annual increase in CO_2 production of an area.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

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Honolulu, HI 96813
HDF@Group70int.com

Subject: Comments on Preparation Notice of Draft Environmental Impact Statement (EIS) for Hawaii Dairy Farms' Proposed Dairy Operation

Dear Ms. McIntyre and Mr. Overton,

Because Mahaulepu is one of the few open spaces in the Poipu area and is beloved by both residents and visitors it is important that there be very strict monitoring so that the dairy has very little to no impact on the area.

1. Percolation studies of the soil on all parts of the dairy land - both before and after the cows come. How and when will these studies be done and how transmitted to the public?

1. If the studies in #1 show any increase in pollution to the stream or ocean, exactly what action will be taken by the company? Will the number of cows be cut or not increased? What are the guidelines for cutting the herd size or not increasing it?

1. Exactly what kind of road development will take place for shipping out milk and shipping in feed, equipment and workers?

1. Is there enough shipping to send all the milk to Oahu for processing? What plans are there for increasing shipping? Have the shipping companies enough capacity? Please quote their responses.

1. What present walking trails will be impacted and what are plans to continue those trails or make others?

1. There is a lot of population near the dairy site. Exactly what will be done to ensure that there is minimal to no impact on this population: this includes wind monitoring before and after cows come, distance cow smells will be felt, noise involved in the operation and air quality? Show studies both before and after the cows come and make the results available to the public.

1. Impact of runoff. Studies now and after cows come. What will be done and is there any impact?

1. If the dairy fails what will be the left over impact on soil quality? What is that quality before and after cows come and after the dairy shuts down? Will there be money set aside to care of all detriments if the dairy goes out of business?

1. What is the EXACT plan for selling the milk and to whom? What if cost of milk continues to fall? How low can it go for the company to still make a profit? Take into account the cost of transportation, containers, feed and all monitoring that will be necessary and how will the results be transmitted to the public?

1. Will the dairy use of water reduce the water needed by farmers and for drinking?

1. Exactly how many additional electric poles will be needed for electricity to the site or will the wires be put underground?

1. Exactly where will the buildings, (milking parlor, offices, etc.,) be situated so they do not show from the shore and walking paths?
1. Any small impacts (noise, smell, sight, etc.) should be considered as a whole to assess the total impacts. How will you do this monitoring before and after the cows come and transmit it to the public?

I would like to be listed as a consultant person for the draft EIS.

Sincerely,

Margery Freeman

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808-823-1797
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May 26, 2016

Margery Freeman
freemanmargery@gmail.com

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Margery Freeman:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

SOILS: Soil is an ecosystem that can be managed to provide nutrients for plant growth, to absorb and hold rainwater for use during dryer periods, to filter and buffer potential pollutants from leaving fields, to serve as a firm foundation for agricultural activities, and to provide habitat for soil microbes to flourish and diversify to keep the ecosystem healthy. Two rounds of independent soil sampling were undertaken at HDF to understand and characterize available soil nutrients and conditions. Section 4.3 of the Environmental Impact Statement (EIS) characterizes soil conditions, and anticipated impacts from effluent and supplemental nutrient application. Recommendations from Dr. Russell Yost and Nicholas Krueger of the University of Hawai'i at Mānoa are summarized. Their baseline nutrient report is included as Appendix C of the Draft EIS.

Soil conservation is a core principal behind establishment of the NRCS, which was formed out of the Soil Conservation Service to acknowledge its expanded role in

watershed-scale approach using science-based tools and standards in agronomy, engineering economics, wildlife biology and other disciplines to aid landowners in implementation of conservation practices. NRCS conservation practices are listed in Chapter 3, Section 3.2; these practices codes identify design and construction standards related to drainage, materials, operations and applicable engineering standards. HDF will follow the developed Conservation Plan, which was approved by the West Kaua'i Soil & Water Conservation District in December, 2013.

The United States Department of Agriculture (USDA) Natural Resources Conservation Services (NRCS) has mapped and classified soils for more than 95 percent of the United States. Comments received during the initial scoping for this EIS included a "Custom Soils Resource Report for Island of Kaua'i, Hawai'i." The report was generated from the USDA NRCS website, which allows any internet user to define an area of interest, customize data results, and generate a Custom Soil Resource Report. The user can select or deselect parameters based upon which data the user would like to display. These user-generated reports are not evaluated by NRCS.

The NRCS soils classifications and descriptions provide a good information base, however, in-field soils testing is needed to identify existing soil nutrient levels and conditions. The most abundant soil types at the HDF site are Kalihi Clay at 32 percent, Ka'ena Clay Brown Variant at 29 percent, and Lualualei Clay at roughly 14 percent of the dairy site. Laboratory analysis of soil samples collected in 2014 identified levels of pH, phosphorus, nitrogen, potassium, calcium, magnesium, organic matter, salinity, micronutrients and other constituents. The results illustrate that the soils are depleted of nutrients, which is typical for lands formerly used for sugarcane. The soil nutrient status and fertility demands of the primary crop, Kikuyu grass, were used to identify the quantities of nutrients required for productive grass growth. The soils data provide a baseline to guide adaptive nutrient management throughout establishment and maturity of the dairy.

A second round of field sampling was conducted in 2015, and focused on evaluation of soils characterized as "poorly drained", and established a quantitative baseline of soil salinity and sodicity to provide for future monitoring of soil health with application of manure effluent. Laboratory analysis determined electrical conductivity and exchangeable sodium percentage, in addition to nutrient levels of nitrogen phosphorus calcium, magnesium, and potassium.

Poorly drained is not an indication of low or poor infiltration. Infiltration refers to the ability of water to enter the soil surface, whereas "drainage" refers to the movement of water within or from the soil profile. Poorly drained soils typically have low hydraulic conductivity, or a slow rate of groundwater movement through the soil. This slow movement can create anaerobic conditions, which typically result in higher rates of denitrification. This is the conversion of potentially nitrates and nitrites to gaseous forms, which reduces the potential for impacts on waterbodies. In this way, "poorly drained" soils may represent less risk of nitrate and nitrite leaching to associated waterbodies than "well drained" soils (Yost, 2016).

As a result of reduced movement of water through the soil profile, the mobility of nutrients such as potassium and phosphorus is also reduced. Soil types at the HDF site are known to adsorb and retain large amounts of phosphorus. Under the NRCS phosphorus leaching index for Hawai'i soils, HDF soils show low risk for leaching. With low risk, phosphorus can be applied at rates greater than crop requirements if manure or other organic materials are used to supply nutrients.

The dairy's focus on robust and healthy grass growth will build organic matter in soils through use of manure as a natural fertilizer. Soil can incorporate carbon from the atmosphere, which benefits soil health. According to recent studies in the Soil Science Society of America Journal, the conversion of formerly tilled cropland to grazed pasture can drive substantial accumulation of organic carbons in soil, with a potential to offset up to one-third of the annual increase in atmospheric carbon dioxide. The potential soil organic matter and carbon dioxide sequestration benefits are likely greatest in highly degraded soils in warm subtropical climates, partly due to long pasture-growing seasons. Long-term soil impacts are anticipated to result in improvement to the physical, chemical, and biological condition of the soil.

ARCHAEOLOGICAL AND CULTURAL: The Hawai'i Dairy Farms (HDF) project is subject to a historic preservation review by the State Department of Land and Natural Resources, State Historic Preservation Division (SHPD) under HRS Chapter 6E and Chapter 13-284. An Archaeological Inventory Survey (AIS) and a Cultural Impact Assessment (CIA) were conducted by Scientific Consultant Services (SCS) for the proposed project. EIS Sections 4.7 and 4.8 provide an evaluation of archaeology and cultural resources, with technical studies in Appendix G and H.

A total of sixteen historic properties were identified through a pedestrian survey of the project area and an extended survey area of 100 meters of the northern boundary. Six historic-era sites occur in the project area and 10 sites occur in the extended survey area. Only one of the sites is believed to be associated with pre-Contact and/or early historic times. State Site 50-30-10-2250, the agricultural heiau, and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area. The remaining sites consist of historic-era bridges, ditches, culverts, retaining walls, and a flume system dating from the 20th century and are affiliated with sugarcane cultivation.

That a majority of the documented sites are related to the historic-era is not surprising, given the massive landscape modifications that occurred during intensive sugarcane cultivation on the valley floor. Even historic era cultural materials associated with the many Land Commission Awards in the project area were non-existent, as explored through survey and subsurface exploration.

The sixteen historic properties have been assessed for significance by the archaeological consultant and the dairy project is anticipated to have no impact on these sites. No further archaeological work is recommended for the sites. Two of the sixteen sites are considered significant under multiple criteria, but occur outside the project area on lands owned by a different landowner. Both sites will not be adversely affected by the proposed dairy project. No site is related to burials, and no bonex were found. Such sites have been reported along coastal areas in sand dunes.

The cultural assessment examined the potential effect of the project on cultural resources, practices or beliefs, its potential to isolate cultural resources, practices or beliefs from their setting, and the potential of the project to introduce elements which may alter the setting in which cultural practices take place. Information received from the community indicates the Māhā'ulepū Ahupua'a, has been and is currently used for traditional cultural purposes. However, the dairy project area has not been included in these activities. It is clear that the gathered plants, trails, State Site 50-30-10-2250, the agricultural heiau, and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area.

The project will be fully enclosed by perimeter fencing along the boundary of the leased premises, which will ensure that project activities and any related impacts are contained within the project area. Based on the research and comments received from the community, it is reasonable to conclude that, pursuant to Act 50, the exercise of native Hawaiian rights or any ethnic group related to numerous traditional cultural practices will not be impacted by establishment of the dairy.

NOISE: Existing noise conditions of the project site and the surrounding Māhā'ulepū valley area are evaluated in the Draft Environmental Impact Statement (EIS), along with anticipated short-term and long-term noise conditions associated with the dairy farm and planned mitigation actions. Draft EIS Section 4.12 addresses noise conditions.

Noise can be defined as unwanted sound, a sound that is considered loud or unpleasant, and/or sound that causes disturbance. Research related to noise and livestock focuses on noise levels and minimization of unexpected sounds that cause undue stress on cows. Noise stress results in loss of livestock productivity and thereby financial loss to farmers and ranchers. Little research exists on the sound levels from livestock.

Sound is measured in decibels (dB). The State of Hawai'i Department of Health (DOH) rules use the A-weighting sound network (dBA) in the HAR §11-46, Community Noise Control. Sound through the air is similar to ripples on a pond of water. In open space without reflection, ripples spread uniformly in all directions and decrease in amplitude further from the source. In free field conditions such as outdoors, amplitude drops by half as distance doubles (OSHA, 2016). When sound passes close to absorbing ground cover such as grassland and fields, the "soft ground" absorbs extra sound as it passes. The Hawai'i Dairy Farms (HDF) site in Māhā'ulepū Valley is approximately 2 miles from the resort area, and 1.5 miles from the closest residential areas (on land zoned for agriculture). Typical noise currently generated near the HDF site includes truck ingress/egress along private farm roads, agricultural equipment, and cattle and sheep.

Construction work at the project site will involve activities that may generate an increase in noise levels. However, such exposures will be a short-term condition, occurring during daylight hours. Construction vehicles and activities must comply with DOH Administrative Rules. DOH noise control regulation requires a permit for construction activities that emit noise in excess of 78 decibels or that cost a total of more than $250,000. Mitigation measures to minimize construction noise will

include the use of mufflers to suppress loud equipment and limitations on the hours of heavy equipment operation.

The dairy farm will utilize milking equipment contained in the milking parlor, and will use field equipment such as tractors. Under HAR §11-46, agriculture is classified as Zoning District Class C, which specifies maximum permissible sound levels of 70 dBA in the daytime and 70 dBA at nighttime. Dairy operations will generate noise in keeping with agricultural zoning of the parcel. The primary noise receptors in the area would be farmers working nearby parcels. Noise from the dairy will not exceed the DOH threshold, and will not contribute to excessive noise in the region.

DEMOGRAPHIC AND ECONOMIC: The potential impacts of Hawai'i Dairy Farms (HDF) to the existing economy were evaluated in the Draft Environmental Impact Statement (EIS), including a fiscal impact assessment report completed in April, 2016 by Plasch Economics Pacific. Draft EIS Section 4.15 addresses demographic and economic factors, with the complete report in Appendix J.

The HDF project would create short-term benefits through jobs for local construction personnel and local material suppliers. Such jobs would include equipment operators, cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, supervisors, painters, etc. Based on State employment multipliers, indirect employment related to Dairy construction would be expected to average about 16 jobs on Kaua'i, and 8 on O'ahu. Construction employment would be expected to average about 12 jobs per year during the development period. Thus direct-plus-indirect employment association with construction would be expected to average approximately 36 jobs, of which 28 would be on Kaua'i.

The HDF project would contribute to diversification of Kaua'i's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Hawai'i Island), approximately10 percent of Hawai'i's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and indirect full-time equivalent jobs on Kaua'i, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on O'ahu.

HDF is expected to generate a net income of approximately $68,000 to the County when the 699 cow herd is established. When the dairy has matured to full production for the 699 cow dairy, net income to the State is calculated at $160,000 annually. With the potential contemplated herd size of up to 2,000 mature dairy cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be produced. This would double local milk production currently supplied by operational dairies on the Island of Hawai'i.

Additional employment generated by a possible expansion to accommodate the

contemplated 2,000 mature dairy cow herd is estimated at approximately 3 construction jobs plus 4 indirect jobs on Kaua'i, and 2 indirect jobs on O'ahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an additional 5 full-time farm jobs would be added, with approximately 15 additional indirect jobs on Kaua'i and another 8 indirect jobs on O'ahu.

The dairy is expected to generate a net additional contribution to the County of approximately $8,000 for improvements related to expansion for the contemplated herd size of up to 2,000 mature dairy cows ($76,000 total versus $68,000 for the committed herd size). The State will derive approximately $360,000 annually in revenues from the contemplated 2,000-mature dairy cow dairy.

Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhā'ulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the

ground. The hydraulic conductivity of the alluvium that underlies Māhāʻulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Poʻipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhāʻulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawaiʻi Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhāʻulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhāʻulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhāʻulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kauaʻi community.

Regional Water Demand: The adjacent, developed Kōloa-Poʻipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kauaʻi will increase county-wide by 17,300 residents by 2030. The South Kauaʻi population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kauaʻi region (the Kōloa - Poʻipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhāʻulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhāʻulepū watershed.

The HDF site is located on the bottom-land of the upper Māhāʻulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Haʻupu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhāʻulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kauaʻi Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore

recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhāʻulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhāʻulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhāʻulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to

increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Poʻipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kaua'i community.

TRAFFIC: The Draft Environmental Impact Statement (EIS) Section 4.18 and 4.25 includes an evaluation of roadways and traffic conditions, along with potential impacts of the dairy farm construction and operation. Primary access to the site is via Māhā'ulepū Road, a two-way, two-lane road, which is accessible from Kōloa Road (Highway 530) via Ala Kinoiki Road. Within the project area, there is a network of unimproved private agriculture haul roads that provide access to and from Māhā'ulepū Road.

Roadways in the project area operate smoothly with no periods of heavy traffic. On average, traffic in the region is much lower than urban areas in the state due to the low population of Kaua'i and rural agricultural demographics of the south Kaua'i area and Māhā'ulepū. Traffic on Māhā'ulepū Road consists of agricultural vehicles, residential and resort visitor traffic.

During construction, the proposed project is not expected to have a significant short term impact on traffic operations in the project vicinity. Additional traffic will be generated during construction, but will return to normal levels after project completion during day-to-day operations. There will be no change to traffic patterns or infrastructure related to the public roads.

Traffic operations along Māhā'ulepū Road and the surrounding County roads are expected to continue to operate at acceptable levels of service during peak hours of traffic. The projected increase in vehicle movements related to HDF operations for the committed herd size of 699 cows would include 5 daily employees accessing the site, milk tanker and supply trucks every two days, and truck with stock trailer, for a total of 12 additional vehicle trips per day. Daily traffic along Ala Kinoiki Road and Kōloa Road was 8,000 and 6,500 cars daily; HDF-related traffic would add less than one percent additional trips. These additional trips would have a minimal effect on traffic conditions at County roadways in the surrounding area.

At a contemplated herd size of up to 2,000 cows, an additional 11 vehicle trips per day would access the HDF site, for a total of 23 vehicle trips daily. Projections for daily vehicle movements in 2035 for Ala Kinoiki Road and Kōloa Road are 7,200 and 9,500 daily vehicles. HDF-related traffic would add less than one percent. These additional trips would have a minimal effect on traffic conditions at County roadways in the surrounding area. Traffic data is presented in the Draft EIS Sections 4.18 and 4.24.

Construction equipment mobilization will comply with Hawai'i Department of Transportation and County requirements. Delivery trucks and milk tanker trucks

will be in compliance with State and County size and weight limits; no oversized vehicles will be used for ongoing operations.

AIR QUALITY: As a part of the Environmental Impact Statement (EIS), existing air quality conditions and project impacts were evaluated, including dust and odor. Potential odors and emission levels for air pollutants relevant to dairy operations were modeled, as currently there are no cows on site. EIS sections 4.19 and 4.25 provide an evaluation of air quality and odors, including a windrose depicting wind speed and direction in the area (see DEIS Section 4.1, Climate). The full air quality technical report can be found in Draft EIS Appendix I.

Clean Air Act

Under the *Clean Air Act of 1970* (CAA), amended November 1990, the U.S. Environmental Protection Agency (EPA) regulates both large and small sources of air pollutants by establishing National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. The State of Hawai'i has established its own *State Ambient Air Quality Standards* (SAAQS) that are as strict or, in some cases more strict than the NAAQS. State standards prohibit any visible emissions of fugitive dust from construction activities at the property line.

Emissions relevant to livestock operation include particulate matter and fugitive dust. Greenhouse gases related to dairy cows include methane (CH_4) from enteric fermentation, and both methane and nitrous oxide (N_20) emissions from manure application. No State or Federal regulations for greenhouse gas emissions from farm operations or small businesses currently exist.

DUST

Dust will be generated as cows move along soft limestone walkways that connect the paddocks and lead to and from the milking parlor. Potential fugitive dust emission rates were estimated from published literature, where particulate matter (PM) is measurable from the "drylots" of confined dairy operations where animals walk over dirt and dried manure throughout the day.

Applying the emission rates from this available literature greatly overestimates potential emission resulting from HDF. Cows in the pastoral rotational-grazing system will be on pasture 22 hours each day and will spend two hours – in two separate milking cycles –moving to and from the barn for the 10- to 15-minute milking sessions.

Using atmospheric dispersion modeling system (AERMOD), the rates were scaled to the size of the non-pasture areas used by cows at HDF. Results were added to the background concentration of particulate matter (both PM_{10} and $PM_{2.5}$) measured on the island of Kaua'i, and the total concentration was compared to the State ambient air quality standards. Only the contemplated herd size of up to 2,000 mature dairy cows was modeled, as at the lower threshold of 699 cows, the potential fugitive dust impact would be negligible. The estimated concentration for PM_{10} is 2.01 $\mu g/m^3$, well below the State standard of 150 $\mu g/m^3$. The estimated concentration for $PM_{2.5}$

is 0.23 μg/m³, well below the Federal standard of 35 μg/m³ (see Draft EIS Section 4.19 and Table 4-19.2).

ODOR

Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF, so air dispersion models were used to determine potential odor levels. Local weather data was used in conjunction with the AERMOD modeling system, and published rates for manure odors emissions for dairy heifers and effluent ponds were adapted to reflect the HDF facilities.

Odor emission sources identified for modeling at HDF were manure in the pasture fields, irrigation water containing diluted nutrients from effluent, the effluent storage ponds, and the dairy buildings. Odor rates from published research were applied. Odor isopleths (a line used to map all points having the same numerical value) were created to display the model findings. Odor is described in "odor units" at the threshold of perception, which is defined by the point at which 50 percent of panelists, in laboratory conditions, cannot smell the odor but 50 percent of the panelists can detect the odor.

Modeling results were generated for worst case meteorological conditions (low wind velocity / mixing). Generally, tradewinds will disperse odors to less than detectable levels beyond the HDF site; in periods of no wind, odor may not be dispersed creating the "worst case" scenario. In these periods without normal tradewind flow, the odor plume would extend to the south of the HDF site. Sections 4.19.2 and 4.25.2 of the EIS include graphics of the potential odor isopleths.

Results for the committed herd size of 699 mature dairy cows show that odors may be detectable by 50 percent of the sensitive population once per 200 hours, or 44 hours per year, within an area that extends approximately 1,670-feet (within one-third of a mile) beyond the dairy farm boundary, and does not reach recreational or residential areas. Results for the contemplated expanded herd size of up to 2,000 mature dairy cows show odors would not extend beyond 2,780 feet outside the HDF boundary (just over half a mile), again not reaching recreational or residential areas, and again with detection limited to 50 percent of the sensitive population approximately 44 hours per year. The parameters used in the analysis were intentionally conservative, and the impacts shown assume an unlikely confluence of worst-case meteorological data, irrigation location, and grazing location. Actual offsite odor impacts are likely to be much lower and/or less frequent than shown; it is likely odor detection beyond the HDF boundaries will be less frequent.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

Feb. 10, 2015 SG.
Group 70 International, Inc.
925 Bethel St, 5th Floor
Honolulu, HI 96813
Re: EISPN - Hawaii Dairy Farm

Maha`ulepu. The place name evokes fondest memories. Since discovering this pristine spot on a guided walk with Malama Maha`ulepu President, Beryl Blaich in 2008, Kaua`i's last undeveloped watershed has been "the" special hike we've taken with family and friends. Everyone recognizes immediately its spectacular beauty; preserving its rare character is naturally a topic of our conversations.

Now we're learning about Wai`opili Stream pollutants from Dr. Carl Berg's water tests, confirmed and retesting done currently by Hawaii State Dept of Health. And that Hawaii Dairy Farms (HDF) wants to install a dairy farm on this land of not only priceless beauty but of historically significant archeological sites — heiau, burial dunes, petroglyphs, tide- pools, salt beds — and cultural practices performed to this day. Several visits to Makauwahi Cave Reserve greatly inspires Maha`ulepu's protection.

Kyle Datta, general partner Ulupono Initiative states the dairy's purpose is "to produce fresh, local milk for families across Hawaii State at prices everyone can afford" and that the dairy "will strengthen the ability of the agricultural sector to continue to provide meaningful jobs and valuable economic support for Kaua`i." Highly debatable.

In my opinion, the strengths of Kaua`i are our Environment—clean Air, clean Water, clean Land, clean Ocean—and, the Spirit of our Citizenry. Environmental degradation continually takes place from chemical sprays, fuels, exhaust, landfills, poor practices such as discarding plastics and nets in the sea, the presence of people and animals, and so forth.

I oppose HDF's dairy plan. Collective manure calculations, clay soils allowing manure/urine run- off into this vital land and surrounding seas are recipes for disaster. Hawaii State Dept of Health should fear well-water contamination. Dr. Katherine Muzik, Marine Biologist, told me her dive in waters off Maha`ulepu revealed a gorgeous living coral, large as a car. How long will our land and seas sustain viability with constant cow mess run-off? We cannot keep compromising our environment with unchecked development after unchecked development.

HDF plans copious water withdrawals from the Waita Reservoir. That must not be allowed to happen. Water belongs to Everyone per our Hawaii State Supreme Court.

And the odoriferous stink! No one wants to smell a dairy farm, neither residents nor visitors. Think reduced residential and business property values. Think residents selling (if they can) and leaving; think visitors flying elsewhere.

Flies. They always accompany cows. HDF plans wasp importation, a foolish if not absurd idea. Dealing with a negative with another negative results in two (2) negatives. Example: importation of guinea grass to feed earlier livestock has resulted in island-wide invasion of that grass.

What about the plan to ship all the milk to Oahu for pasteurization and bottling and distribution? I feel that is a very unsustainable practices plan. Milk must leave in expensive refrigerated units, in all likelihood never to show up on Kaua`i Island again.

I recall Amy Henessey, HDF spokesperson, saying there may be as many as 15 jobs created with the dairy in place. While I don't pooh-pooh 15 jobs, the resulting environmental degradation level by HDF that weighs in would in all likelihood be tragic. The curtailment/loss of hundreds of visitor industry jobs may be at stake. Grand Hyatt, Po`ipu, itself employs 800+ Kaua`i residents.

It isn't Environmentally sound and it isn't Sustainable, therefore I urge NO DAIRY at Maha`ulepu.

Sharon Goodwin

Sharon Goodwin
PO Box 446
Kapa`a, HI 96746
Email sharonmokihana@gmail.com
808-822-7646

Please keep me informed of EIS Process. Thank you.
SG.

May 26, 2016

Sharon Goodwin
PO Box 446
Kapa'a, HI 96746
sharonmokihana@gmail.com

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Sharon Goodwin:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

ARCHAEOLOGICAL AND CULTURAL: The Hawai'i Dairy Farms (HDF) project is subject to a historic preservation review by the State Department of Land and Natural Resources, State Historic Preservation Division (SHPD) under HRS Chapter 6E and Chapter 13-284. An Archaeological Inventory Survey (AIS) and a Cultural Impact Assessment (CIA) were conducted by Scientific Consultant Services (SCS) for the proposed project. EIS Sections 4.7 and 4.8 provide an evaluation of archaeology and cultural resources, with technical studies in Appendix G and H.

A total of sixteen historic properties were identified through a pedestrian survey of the project area and an extended survey area of 100 meters of the northern boundary. Six historic-era sites occur in the project area and 10 sites occur in the extended survey area. Only one of the sites is believed to be associated with pre-

Contact and/or early historic times. State Site 50-30-10-2250, the agricultural heiau, and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area. The remaining sites consist of historic-era bridges, ditches, culverts, retaining walls, and a flume system dating from the 20th century and are affiliated with sugarcane cultivation.

That a majority of the documented sites are related to the historic-era is not surprising, given the massive landscape modifications that occurred during intensive sugarcane cultivation on the valley floor. Even historic era cultural materials associated with the many Land Commission Awards in the project area were non-existent, as explored through survey and subsurface exploration.

The sixteen historic properties have been assessed for significance by the archaeological consultant and the dairy project is anticipated to have no impact on these sites. No further archaeological work is recommended for the sites. Two of the sixteen sites are considered significant under multiple criteria, but occur outside the project area on lands owned by a different landowner. Both sites will not be adversely affected by the proposed dairy project. No site is related to burials, and no bonex were found. Such sites have been reported along coastal areas in sand dunes.

The cultural assessment examined the potential effect of the project on cultural resources, practices or beliefs, its potential to isolate cultural resources, practices or beliefs from their setting, and the potential of the project to introduce elements which may alter the setting in which cultural practices take place. Information received from the community indicates the Māhā'ulepū Ahupua'a, has been and is currently used for traditional cultural purposes. However, the dairy project area has not been included in these activities. It is clear that the gathered plants, trails, State Site 50-30-10-2250, the agricultural heiau, and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area.

The project will be fully enclosed by perimeter fencing along the boundary of the leased premises, which will ensure that project activities and any related impacts are contained within the project area. Based on the research and comments received from the community, it is reasonable to conclude that, pursuant to Act 50, the exercise of native Hawaiian rights or any ethnic group related to numerous traditional cultural practices will not be impacted by establishment of the dairy.

PESTS: A study of invertebrate species and pest insects was conducted by Steven Lee Montgomery, PhD, Consulting Biologist in January 2016. The study summarizes the presence or absence of native species or pest species associated with cattle manure in the general Māhā'ulepū area, as well as the parasites and predators that control those species. No federally or state listed endangered or threatened invertebrate species were noted in the survey of the site. A full report and list of species found on site is provided in EIS Section 4.11 and Appendix B.

Flies were identified on the HDF site using manure from neighboring livestock as bait for invertebrates. The two flies associated with livestock are the stable fly and the horn fly, the latter known for biting cattle. These flies and the greenbottle fly are often confused with the house fly. Flies known to exist on Kaua'i but not seen at the

HDF site include the house fly, the dog dung fly, and the chicken dung fly. These pests are common in areas with high pet populations. It is possible these fly species could inadvertently be brought to the dairy and utilize manure as a food source. HDF will prevent and control fly population growth through diligent clean up and sanitation practices regarding any trash and food waste, as well as through efficient manure composting practices. A full list of site management measures is provided in EIS Section 4.11. The project location does not provide any habitat for *drosophila musaphilia*, the only Kaua'i species of native Hawaiian fly listed as Endangered or Threatened. Native Drosophila habitat is located many miles away in the high elevation koa-'ōhi'a forests.

Fly populations at HDF will be minimized through a process known as Integrated Pest Management (IPM). Essentially, IPM disrupts reproduction with appropriate means at key points in the pest's life cycle. Used in Hawai'i for decades, a number of invertebrates and a bird (the cattle egret) were introduced between 1898 and 1950 to reduce livestock-related insects. IPM utilizes knowledge of the ancient food web among species.

An especially important insect to minimize fly breeding habitat in manure is the dung beetle, which buries manure and incorporates it into the soil. Populations of dung beetles found on Kaua'i and those species already in Māhā'ulepū Valley, will increase with the increased manure food source, thus increasing and speeding breakdown of manure. Dung beetles are specialists in the very important natural process of breaking up and quickly recycling bovine manure pads. The behavioral diversity among dung beetle species will work together to bury dung pats in one to three days, a shorter amount of time than the 10-30 days flies eggs need to hatch.

In the Kōloa-Po'ipū region, pest fly populations are dependent upon food and breeding sources nearby such as dog, cat, and chicken feces. Beef cattle graze in the region on agricultural lands along Ala Kinoiki Road between Kōloa and Po'ipū, and it is likely the livestock-related flies identified at the HDF site occur in this region as well. Localized controls to reduce pest populations need to address breeding sites in and amongst the food and animals wastes within the area. These mitigation measures will make it difficult for flies to breed, and BMPs will be enforced to address any increase in population, therefore it is expected that the dairy farm will not significantly affect recreational and resort areas.

DEMOGRAPHIC AND ECONOMIC: The potential impacts of Hawai'i Dairy Farms (HDF) to the existing economy were evaluated in the Draft Environmental Impact Statement (EIS), including a fiscal impact assessment report completed in April, 2016 by Plasch Economics Pacific. Draft EIS Section 4.15 addresses demographic and economic factors, with the complete report in Appendix J.

The HDF project would create short-term benefits through jobs for local construction personnel and local material suppliers. Such jobs would include equipment operators, cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, supervisors, painters, etc. Based on State employment multipliers, indirect employment related to Dairy construction would

be expected to average about 16 jobs on Kaua'i, and 8 on O'ahu. Construction employment would be expected to average about 12 jobs per year during the development period. Thus direct-plus-indirect employment association with construction would be expected to average approximately 36 jobs, of which 28 would be on Kaua'i.

The HDF project would contribute to diversification of Kaua'i's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Hawai'i Island), approximately10 percent of Hawai'i's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and indirect full-time equivalent jobs on Kaua'i, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on O'ahu.

HDF is expected to generate a net income of approximately $68,000 to the County when the 699 cow herd is established. When the dairy has matured to full production for the 699 cow dairy, net income to the State is calculated at $160,000 annually. With the potential contemplated herd size of up to 2,000 mature dairy cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be produced. This would double local milk production currently supplied by operational dairies on the Island of Hawai'i.

Additional employment generated by a possible expansion to accommodate the contemplated 2,000 mature dairy cow herd is estimated at approximately 3 construction jobs plus 4 indirect jobs on Kaua'i, and 2 indirect jobs on O'ahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an additional 5 full-time farm jobs would be added, with approximately 15 additional indirect jobs on Kaua'i and another 8 indirect jobs on O'ahu.

The dairy is expected to generate a net additional contribution to the County of approximately $8,000 for improvements related to expansion for the contemplated herd size of up to 2,000 mature dairy cows ($76,000 total versus $68,000 for the committed herd size). The State will derive approximately $360,000 annually in revenues from the contemplated 2,000-mature dairy cow dairy.

Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement

(EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhāʻulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhāʻulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Poʻipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhāʻulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawaiʻi Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD

produced by the on-site, existing Māhāʻulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhāʻulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhāʻulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kauaʻi community.

Regional Water Demand: The adjacent, developed Kōloa-Poʻipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kauaʻi will increase county-wide by 17,300 residents by 2030. The South Kauaʻi population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kauaʻi region (the Kōloa - Poʻipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhāʻulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhāʻulepū watershed.

The HDF site is located on the bottom-land of the upper Māhāʻulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Haʻupu

Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhāʻulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kauaʻi Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhāʻulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhāʻulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhāʻulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or

maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater

and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Po'ipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kaua'i community.

AIR QUALITY: As a part of the Environmental Impact Statement (EIS), existing air quality conditions and project impacts were evaluated, including dust and odor. Potential odors and emission levels for air pollutants relevant to dairy operations were modeled, as currently there are no cows on site. EIS sections 4.19 and 4.25 provide an evaluation of air quality and odors, including a windrose depicting wind speed and direction in the area (see DEIS Section 4.1, Climate). The full air quality technical report can be found in Draft EIS Appendix I.

Clean Air Act

Under the *Clean Air Act of 1970* (CAA), amended November 1990, the U.S. Environmental Protection Agency (EPA) regulates both large and small sources of air pollutants by establishing National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. The State of Hawai'i has established its own *State Ambient Air Quality Standards* (SAAQS) that are as strict or, in some cases more strict than the

NAAQS. State standards prohibit any visible emissions of fugitive dust from construction activities at the property line.

Emissions relevant to livestock operation include particulate matter and fugitive dust. Greenhouse gases related to dairy cows include methane (CH_4) from enteric fermentation, and both methane and nitrous oxide (N_20) emissions from manure application. No State or Federal regulations for greenhouse gas emissions from farm operations or small businesses currently exist.

DUST

Dust will be generated as cows move along soft limestone walkways that connect the paddocks and lead to and from the milking parlor. Potential fugitive dust emission rates were estimated from published literature, where particulate matter (PM) is measurable from the "drylots" of confined dairy operations where animals walk over dirt and dried manure throughout the day.

Applying the emission rates from this available literature greatly overestimates potential emission resulting from HDF. Cows in the pastoral rotational-grazing system will be on pasture 22 hours each day and will spend two hours – in two separate milking cycles –moving to and from the barn for the 10- to 15-minute milking sessions.

Using atmospheric dispersion modeling system (AERMOD), the rates were scaled to the size of the non-pasture areas used by cows at HDF. Results were added to the background concentration of particulate matter (both PM_{10} and $PM_{2.5}$) measured on the island of Kaua'i, and the total concentration was compared to the State ambient air quality standards. Only the contemplated herd size of up to 2,000 mature dairy cows was modeled, as at the lower threshold of 699 cows, the potential fugitive dust impact would be negligible. The estimated concentration for PM_{10} is 2.01 $\mu g/m^3$, well below the State standard of 150 $\mu g/m^3$. The estimated concentration for $PM_{2.5}$ is 0.23 $\mu g/m^3$, well below the Federal standard of 35 $\mu g/m^3$ (see Draft EIS Section 4.19 and Table 4-19.2).

ODOR

Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF, so air dispersion models were used to determine potential odor levels. Local weather data was used in conjunction with the AERMOD modeling system, and published rates for manure odors emissions for dairy heifers and effluent ponds were adapted to reflect the HDF facilities.

Odor emission sources identified for modeling at HDF were manure in the pasture fields, irrigation water containing diluted nutrients from effluent, the effluent storage ponds, and the dairy buildings. Odor rates from published research were applied. Odor isopleths (a line used to map all points having the same numerical value) were created to display the model findings. Odor is described in "odor units" at the threshold of perception, which is defined by the point at which 50 percent of

panelists, in laboratory conditions, cannot smell the odor but 50 percent of the panelists can detect the odor.

Modeling results were generated for worst case meteorological conditions (low wind velocity / mixing). Generally, tradewinds will disperse odors to less than detectable levels beyond the HDF site; in periods of no wind, odor may not be dispersed creating the "worst case" scenario. In these periods without normal tradewind flow, the odor plume would extend to the south of the HDF site. Sections 4.19.2 and 4.25.2 of the EIS include graphics of the potential odor isopleths.

Results for the committed herd size of 699 mature dairy cows show that odors may be detectable by 50 percent of the sensitive population once per 200 hours, or 44 hours per year, within an area that extends approximately 1,670-feet (within one-third of a mile) beyond the dairy farm boundary, and does not reach recreational or residential areas. Results for the contemplated expanded herd size of up to 2,000 mature dairy cows show odors would not extend beyond 2,780 feet outside the HDF boundary (just over half a mile), again not reaching recreational or residential areas, and again with detection limited to 50 percent of the sensitive population approximately 44 hours per year. The parameters used in the analysis were intentionally conservative, and the impacts shown assume an unlikely confluence of worst-case meteorological data, irrigation location, and grazing location. Actual offsite odor impacts are likely to be much lower and/or less frequent than shown; it is likely odor detection beyond the HDF boundaries will be less frequent.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

From: Yojana <soundhealing.kauai@gmail.com>
Sent: Friday, February 20, 2015 7:51 PM
To: epo@doh.hawaii.gov; HDF
Subject: Questions and Concerns Re EIS for HDF

Group 70 IAnternational Inc.
Attn.HDF a Project
Honolulu, HI 96813

Hawaii State Dept of Health
environmental Planning Ozffice
Honolulu, HI. 96914

To whom it may concern:

MAHA'ULEPU is a living museum with its diverse ecologies, endangered species and cultural sites. It is imperative that the E.I.S. process acknowledges that there may be many more discoveries yet to be unveiled. How can these be protected and managed? Recent findings by HDF of petroglyphs rocks and heaiau are examples of this.

Please address protection issues for any existing cultural artifacts such as petroglyph rocks and heaiau and the ability of the Native practitioners to be able to continue their practices.

The type of soil in the valley is particularly suited for Kalo cultivation. Surely the run off from the proposed Dairy will impact the existing soil preventing production of Kalo or anything else in the future? How will run off affect the quality of the soil and the Former Salt Pans which can be restored?

Will there be percolation tests conducted? Ground water and surface water contamination is of major concern as the high water table is down from the dairy site.

The valley floor is subject to flooding the possible impacts of run off, spillage etc into the aquifer and ocean must be determined. Waiopli stream cannot afford more pollution and the impacts on the health of beach goers, as well as the ocean, reefs, fishing and endangered sea creatures could be dire. How is this being assessed?

Will a hydrology study be conducted to include both Maha'ulepu and Pa'a?

How will the odors and flies be controlled? Using chemicals and introducing other species to ameliorate flies could result in more environmental and pollution problems.

There are endangered species existing in the valley itself how will these be protected?

The flies, odor and degradation of the beaches would have severe economic and health impacts on the South shore community and visitor industry. Already there are less visitor bookings for 2016 due to the possible Dairy. There are thousands of people whose livelihoods depend upon the visitor industry whereas the Dairy will be employing very few. Please explain how this can be good for our community.

Hawaiians had sustainable ag without milk. Milk is well known to not be good for human consumption. If the milk is shipped off island to be processed how is this sustainable ag and where is the economic validity in such a process? Who is going to make money?

How will the dairy operations impact the local roads? Will more roads need to be built? What are the traffic implications on already congested roads? Will more roads be built in the Valley? If so how will this impact the environment?

What are the implications of the island wide increased bovine populations on our island as a whole?

How can this EIS be non biased with Group 70 as the provider?

This is a Sacred Place please let's treat it with the respect it deserves and do everything that can be done to ensure that there is no damage to this area.

Thank you for your consideration.

Yojana Grace
P.O. Box 1551
KOLOA, HI 96756

GROUP 70
INTERNATIONAL

May 26, 2016

Yojana Grace
PO Box 1551
Koloa, HI 96756
soundhealing.kauai@gmail.com

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Yojana Grace:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

GROUP 70 OBJECTIVITY: Group 70 International, Inc. (Group 70) is responsible for the preparation and processing of the Hawai'i Dairy Farms Environmental Impact Statement (EIS). The EIS was prepared in accordance with the requirements of Chapter 343 Hawai'i Revised Statutes and the "Environmental Impact Statement Rules" (Chapter 200 of Title 11, Hawai'i Administrative Rules). The environmental planning team at Group 70 has prepared several hundred Environmental Assessment and EIS documents over the past 40 years, and every document has been accepted by the responsible County, State and Federal agency. On numerous past EIS projects, the Hawai'i Chapter of the American Planning Association has recognized Group 70's professional work with Chapter awards for excellence in environmental planning. Part of the EIS scoping process involves Group 70's

experienced team of technical sub consultants that are well-known and qualified in their respective fields of study. For this project, Group 70 is preparing the Hawai'i Dairy Farms EIS with the level of analysis required to properly evaluate and disclose the existing environmental conditions, probable impacts with mitigation, and potential cumulative and secondary effects.

SOILS: Soil is an ecosystem that can be managed to provide nutrients for plant growth, to absorb and hold rainwater for use during dryer periods, to filter and buffer potential pollutants from leaving fields, to serve as a firm foundation for agricultural activities, and to provide habitat for soil microbes to flourish and diversify to keep the ecosystem healthy. Two rounds of independent soil sampling were undertaken at HDF to understand and characterize available soil nutrients and conditions. Section 4.3 of the Environmental Impact Statement (EIS) characterizes soil conditions, and anticipated impacts from effluent and supplemental nutrient application. Recommendations from Dr. Russell Yost and Nicholas Krueger of the University of Hawai'i at Mānoa are summarized. Their baseline nutrient report is included as Appendix C of the Draft EIS.

Soil conservation is a core principal behind establishment of the NRCS, which was formed out of the Soil Conservation Service to acknowledge its expanded role in watershed-scale approach using science-based tools and standards in agronomy, engineering economics, wildlife biology and other disciplines to aid landowners in implementation of conservation practices. NRCS conservation practices are listed in Chapter 3, Section 3.2; these practices codes identify design and construction standards related to drainage, materials, operations and applicable engineering standards. HDF will follow the developed Conservation Plan, which was approved by the West Kaua'i Soil & Water Conservation District in December, 2013.

The United States Department of Agriculture (USDA) Natural Resources Conservation Services (NRCS) has mapped and classified soils for more than 95 percent of the United States. Comments received during the initial scoping for this EIS included a "Custom Soils Resource Report for Island of Kaua'i, Hawai'i." The report was generated from the USDA NRCS website, which allows any internet user to define an area of interest, customize data results, and generate a Custom Soil Resource Report. The user can select or deselect parameters based upon which data the user would like to display. These user-generated reports are not evaluated by NRCS.

The NRCS soils classifications and descriptions provide a good information base, however, in-field soils testing is needed to identify existing soil nutrient levels and conditions. The most abundant soil types at the HDF site are Kalihi Clay at 32 percent, Ka'ena Clay Brown Variant at 29 percent, and Lualualei Clay at roughly 14 percent of the dairy site. Laboratory analysis of soil samples collected in 2014 identified levels of pH, phosphorus, nitrogen, potassium, calcium, magnesium, organic matter, salinity, micronutrients and other constituents. The results illustrate that the soils are depleted of nutrients, which is typical for lands formerly used for sugarcane. The soil nutrient status and fertility demands of the primary crop, Kikuyu grass, were used to identify the quantities of nutrients required for productive grass

growth. The soils data provide a baseline to guide adaptive nutrient management throughout establishment and maturity of the dairy.

A second round of field sampling was conducted in 2015, and focused on evaluation of soils characterized as "poorly drained", and established a quantitative baseline of soil salinity and sodicity to provide for future monitoring of soil health with application of manure effluent. Laboratory analysis determined electrical conductivity and exchangeable sodium percentage, in addition to nutrient levels of nitrogen phosphorus calcium, magnesium, and potassium.

Poorly drained is not an indication of low or poor infiltration. Infiltration refers to the ability of water to enter the soil surface, whereas "drainage" refers to the movement of water within or from the soil profile. Poorly drained soils typically have low hydraulic conductivity, or a slow rate of groundwater movement through the soil. This slow movement can create anaerobic conditions, which typically result in higher rates of denitrification. This is the conversion of potentially nitrates and nitrites to gaseous forms, which reduces the potential for impacts on waterbodies. In this way, "poorly drained" soils may represent less risk of nitrate and nitrite leaching to associated waterbodies than "well drained" soils (Yost, 2016).

As a result of reduced movement of water through the soil profile, the mobility of nutrients such as potassium and phosphorus is also reduced. Soil types at the HDF site are known to adsorb and retain large amounts of phosphorus. Under the NRCS phosphorus leaching index for Hawai'i soils, HDF soils show low risk for leaching. With low risk, phosphorus can be applied at rates greater than crop requirements if manure or other organic materials are used to supply nutrients.

The dairy's focus on robust and healthy grass growth will build organic matter in soils through use of manure as a natural fertilizer. Soil can incorporate carbon from the atmosphere, which benefits soil health. According to recent studies in the Soil Science Society of America Journal, the conversion of formerly tilled cropland to grazed pasture can drive substantial accumulation of organic carbons in soil, with a potential to offset up to one-third of the annual increase in atmospheric carbon dioxide. The potential soil organic matter and carbon dioxide sequestration benefits are likely greatest in highly degraded soils in warm subtropical climates, partly due to long pasture-growing seasons. Long-term soil impacts are anticipated to result in improvement to the physical, chemical, and biological condition of the soil.

NATURAL HAZARDS: The potential impacts of natural hazards are evaluated in the Draft Environmental Impact Statement (EIS), including flooding, tsunami, earthquakes, and hurricanes. Draft EIS Section 4.6 addresses natural hazards.

The Māhā'ulepū property is not known to experience flooding conditions. The area is located within Federal Emergency Management Agency (FEMA) Zone X, areas determined to be outside the 0.2% annual chance floodplain. The proposed location for Hawai'i Dairy Farms (HDF) lies between the 60 and 150 feet elevation, outside the tsunami evacuation zone. The Kaua'i and Ni'ihau region of the Hawaiian Islands

has experienced tremors from earthquakes originating further south in the island chain, but no known seismic activity has originated among these northern islands.

Although they occur infrequently, Kaua'i has received a greater amount of damage from hurricanes when compared to the other Hawaiian Islands. Land management personnel in the Māhā'ulepū region during and following the hurricanes that affected Kaua'i in 1982 and 1992 observed defoliation of vegetation, and no flooding events in the period following passage of the storms.

Preparedness is the best protection for natural disasters. Structural design of dairy facilities will meet International Building Code (IBC) 2006 standards with local amendments. Provisions in design will address wind loading (including hurricane gusts), rain and flood loading, and earthquake loading. A geotechnical evaluation of the area recommended Seismic Site Class D under IBC standards be utilized for foundation design where the barns and agricultural infrastructure will be constructed.

There has been no rainfall event that would exceed the capacity of the effluent ponds since rainfall has been recorded in Māhā'ulepū Valley. The effluent pond capacity has been designed above the regulatory requirement to contain the 25-year, 24-hour rainfall event. An emergency containment berm with additional capacity for another 30 days is included in the design. This design exceeds regulatory requirements, with containment in excess of the major rainfall events recorded on Kaua'i over the past three decades.

An emergency preparedness plan for protection of animals has been prepared for HDF internal use that addresses hurricane, fire, and potential flooding hazard scenarios. HDF is not in a tsunami inundation area, so this scenario is not planned for in the disaster plan. The disaster plan relies upon knowledge of cow behavior, and is based on extensive guidance for livestock protection from NRCS, the Florida State Agricultural Response Team (SART), Pennsylvania State College of Agricultural Sciences, and Cornell University Cooperative Extension. The plan includes safety procedures during any disaster, follow up actions, and emergency contacts for assistance before, during or following the event. Further information is provided in the Draft EIS Section 4.6.2.

ARCHAEOLOGICAL AND CULTURAL: The Hawai'i Dairy Farms (HDF) project is subject to a historic preservation review by the State Department of Land and Natural Resources, State Historic Preservation Division (SHPD) under HRS Chapter 6E and Chapter 13-284. An Archaeological Inventory Survey (AIS) and a Cultural Impact Assessment (CIA) were conducted by Scientific Consultant Services (SCS) for the proposed project. EIS Sections 4.7 and 4.8 provide an evaluation of archaeology and cultural resources, with technical studies in Appendix G and H.

A total of sixteen historic properties were identified through a pedestrian survey of the project area and an extended survey area of 100 meters of the northern boundary. Six historic-era sites occur in the project area and 10 sites occur in the extended survey area. Only one of the sites is believed to be associated with pre-Contact and/or early historic times. State Site 50-30-10-2250, the agricultural heiau,

and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area. The remaining sites consist of historic-era bridges, ditches, culverts, retaining walls, and a flume system dating from the 20th century and are affiliated with sugarcane cultivation.

That a majority of the documented sites are related to the historic-era is not surprising, given the massive landscape modifications that occurred during intensive sugarcane cultivation on the valley floor. Even historic era cultural materials associated with the many Land Commission Awards in the project area were non-existent, as explored through survey and subsurface exploration.

The sixteen historic properties have been assessed for significance by the archaeological consultant and the dairy project is anticipated to have no impact on these sites. No further archaeological work is recommended for the sites. Two of the sixteen sites are considered significant under multiple criteria, but occur outside the project area on lands owned by a different landowner. Both sites will not be adversely affected by the proposed dairy project. No site is related to burials, and no bonex were found. Such sites have been reported along coastal areas in sand dunes.

The cultural assessment examined the potential effect of the project on cultural resources, practices or beliefs, its potential to isolate cultural resources, practices or beliefs from their setting, and the potential of the project to introduce elements which may alter the setting in which cultural practices take place. Information received from the community indicates the Māhā'ulepū Ahupua'a, has been and is currently used for traditional cultural purposes. However, the dairy project area has not been included in these activities. It is clear that the gathered plants, trails, State Site 50-30-10-2250, the agricultural heiau, and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area.

The project will be fully enclosed by perimeter fencing along the boundary of the leased premises, which will ensure that project activities and any related impacts are contained within the project area. Based on the research and comments received from the community, it is reasonable to conclude that, pursuant to Act 50, the exercise of native Hawaiian rights or any ethnic group related to numerous traditional cultural practices will not be impacted by establishment of the dairy.

FLORA AND FAUNA: Botanical, avian, and mammalian surveys of the property were conducted for the Draft Environmental Impact Statement (EIS) to assess existing species on site, including identifying any species listed as endangered, threatened, or proposed under any state or federal endangered species programs in or near the property. EIS Sections 4.9 and 4.10 address the evaluation of flora and fauna resources, with technical studies in Appendix A and B.

A botanical survey of the dairy property was conducted in August 2014 by AECOS Consulting to assess existing plant species. The survey also investigated for the presence of plants currently listed as endangered, threatened or proposed for listing under Federal or the State of Hawai'i's endangered species programs, located onsite or within the immediate vicinity of the dairy site. The nature of the land and its present and historical uses for intensive agriculture very much limit the natural

botanical resources anticipated to occur on this land. Complete species lists are included in the EIS, and no protected botanical species occur on the project property. The project will include vegetated buffer strips along the drainage ways as part of the Conservation Plan to reduce erosion and stabilize slopes. Where native plants occur or could survive if planted, native plants will be used in the stabilization. No long-term impacts to native plant habitats or endangered or threatened plants species will occur as a result of the dairy.

Avian and mammalian surveys were conducted in August 2014 by Rana Biological Consulting, Inc. This survey was conducted to assess the potential presence of avian or mammalian species currently listed as endangered, threatened or proposed for listing under either Federal or the State endangered species lists. The survey covered the dairy site area and immediate vicinity. Common birds and terrestrial mammals were encountered on the property. There is no critical habitat for endangered species in the upper Māhāʻulepū Valley.

Four species of endangered waterbirds were recorded on the site and at the nearby taro farm located within the HDF site. Though the area does not provide critical habitat, seabirds that nest in upland areas of Kauai may overfly the site. The endangered Hawaiian goose, nēnē was also seen on the site. State Division of Forestry and Wildlife biologists have noted nēnē are regularly seen on the subject property. It is probable that some nest on or adjacent to the site as this species nests in the general Kōloa area, and the habitat present on parts of the site is suitable for nēnē nesting.

The principal potential impacts posed to the five endangered species include those potentially associated with construction activities, and those associated with dairy farm operations following build-out. Measures will be adopted to avoid potential seabird and nēnē goose collisions with fences and structures. Potential measures include lowering construction cranes at night, using conservation fencing to project-specified areas, marking tall structures and fencing with white visibility polytape, limiting nighttime lighting, and shading any outside lights used at night. Ongoing mitigation strategies will be implemented for day-to-day preventative measures, including an Avian Species Protection Plan. Mitigation measures are further described in DEIS Section 4.10.2.

It is also likely that Hawaiian hoary bats overfly the project area on a seasonal basis. While caution will be taken during any potential disturbance or vegetation removal, there are almost no suitable roost trees within the dairy site, thus it is expected that the dairy farm will not affect this listed mammalian species.

PESTS: A study of invertebrate species and pest insects was conducted by Steven Lee Montgomery, PhD, Consulting Biologist in January 2016. The study summarizes the presence or absence of native species or pest species associated with cattle manure in the general Māhāʻulepū area, as well as the parasites and predators that control those species. No federally or state listed endangered or threatened invertebrate species were noted in the survey of the site. A full report and list of species found on site is provided in EIS Section 4.11 and Appendix B.

Flies were identified on the HDF site using manure from neighboring livestock as bait for invertebrates. The two flies associated with livestock are the stable fly and the horn fly, the latter known for biting cattle. These flies and the greenbottle fly are often confused with the house fly. Flies known to exist on Kauaʻi but not seen at the HDF site include the house fly, the dog dung fly, and the chicken dung fly. These pests are common in areas with high pet populations. It is possible these fly species could inadvertently be brought to the dairy and utilize manure as a food source. HDF will prevent and control fly population growth through diligent clean up and sanitation practices regarding any trash and food waste, as well as through efficient manure composting practices. A full list of site management measures is provided in EIS Section 4.11. The project location does not provide any habitat for *drosophila musaphilia*, the only Kauaʻi species of native Hawaiian fly listed as Endangered or Threatened. Native Drosophila habitat is located many miles away in the high elevation koa-ʻōhiʻa forests.

Fly populations at HDF will be minimized through a process known as Integrated Pest Management (IPM). Essentially, IPM disrupts reproduction with appropriate means at key points in the pest's life cycle. Used in Hawaiʻi for decades, a number of invertebrates and a bird (the cattle egret) were introduced between 1898 and 1950 to reduce livestock-related insects. IPM utilizes knowledge of the ancient food web among species.

An especially important insect to minimize fly breeding habitat in manure is the dung beetle, which buries manure and incorporates it into the soil. Populations of dung beetles found on Kauaʻi and those species already in Māhāʻulepū Valley, will increase with the increased manure food source, thus increasing and speeding breakdown of manure. Dung beetles are specialists in the very important natural process of breaking up and quickly recycling bovine manure pads. The behavioral diversity among dung beetle species will work together to bury dung pats in one to three days, a shorter amount of time than the 10-30 days flies eggs need to hatch.

In the Kōloa-Poʻipū region, pest fly populations are dependent upon food and breeding sources nearby such as dog, cat, and chicken feces. Beef cattle graze in the region on agricultural lands along Ala Kinoiki Road between Kōloa and Poʻipū, and it is likely the livestock-related flies identified at the HDF site occur in this region as well. Localized controls to reduce pest populations need to address breeding sites in and amongst the food and animals wastes within the area. These mitigation measures will make it difficult for flies to breed, and BMPs will be enforced to address any increase in population, therefore it is expected that the dairy farm will not significantly affect recreational and resort areas.

DEMOGRAPHIC AND ECONOMIC: The potential impacts of Hawai'i Dairy Farms (HDF) to the existing economy were evaluated in the Draft Environmental Impact Statement (EIS), including a fiscal impact assessment report completed in April, 2016 by Plasch Economics Pacific. Draft EIS Section 4.15 addresses demographic and economic factors, with the complete report in Appendix J.

The HDF project would create short-term benefits through jobs for local construction personnel and local material suppliers. Such jobs would include equipment operators, cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, supervisors, painters, etc. Based on State employment multipliers, indirect employment related to Dairy construction would be expected to average about 16 jobs on Kaua'i, and 8 on O'ahu. Construction employment would be expected to average about 12 jobs per year during the development period. Thus direct-plus-indirect employment association with construction would be expected to average approximately 36 jobs, of which 28 would be on Kaua'i.

The HDF project would contribute to diversification of Kaua'i's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Hawai'i Island), approximately10 percent of Hawai'i's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and indirect full-time equivalent jobs on Kaua'i, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on O'ahu.

HDF is expected to generate a net income of approximately $68,000 to the County when the 699 cow herd is established. When the dairy has matured to full production for the 699 cow dairy, net income to the State is calculated at $160,000 annually. With the potential contemplated herd size of up to 2,000 mature dairy cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be produced. This would double local milk production currently supplied by operational dairies on the Island of Hawai'i.

Additional employment generated by a possible expansion to accommodate the contemplated 2,000 mature dairy cow herd is estimated at approximately 3 construction jobs plus 4 indirect jobs on Kaua'i, and 2 indirect jobs on O'ahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an additional 5 full-time farm jobs would be added, with approximately 15 additional indirect jobs on Kaua'i and another 8 indirect jobs on O'ahu.

The dairy is expected to generate a net additional contribution to the County of approximately $8,000 for improvements related to expansion for the contemplated herd size of up to 2,000 mature dairy cows ($76,000 total versus $68,000 for the committed herd size). The State will derive approximately $360,000 annually in revenues from the contemplated 2,000-mature dairy cow dairy.

Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhā'ulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhā'ulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Po'ipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhā'ulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawai'i Department of Health Milk

Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhāʻulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhāʻulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhāʻulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kauaʻi community.

Regional Water Demand: The adjacent, developed Kōloa-Poʻipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kauaʻi will increase county-wide by 17,300 residents by 2030. The South Kauaʻi population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kauaʻi region (the Kōloa - Poʻipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhāʻulepū Surface

Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhāʻulepū watershed.

The HDF site is located on the bottom-land of the upper Māhāʻulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Haʻupu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhāʻulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kauaʻi Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhāʻulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhāʻulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhāʻulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Poʻipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kauaʻi community.

TRAFFIC: The Draft Environmental Impact Statement (EIS) Section 4.18 and 4.25 includes an evaluation of roadways and traffic conditions, along with potential impacts of the dairy farm construction and operation. Primary access to the site is via Māhāʻulepū Road, a two-way, two-lane road, which is accessible from Kōloa Road (Highway 530) via Ala Kinoiki Road. Within the project area, there is a network of unimproved private agriculture haul roads that provide access to and from Māhāʻulepū Road.

Roadways in the project area operate smoothly with no periods of heavy traffic. On average, traffic in the region is much lower than urban areas in the state due to the low population of Kauaʻi and rural agricultural demographics of the south Kauaʻi

area and Māhāʻulepū. Traffic on Māhāʻulepū Road consists of agricultural vehicles, residential and resort visitor traffic.

During construction, the proposed project is not expected to have a significant short term impact on traffic operations in the project vicinity. Additional traffic will be generated during construction, but will return to normal levels after project completion during day-to-day operations. There will be no change to traffic patterns or infrastructure related to the public roads.

Traffic operations along Māhāʻulepū Road and the surrounding County roads are expected to continue to operate at acceptable levels of service during peak hours of traffic. The projected increase in vehicle movements related to HDF operations for the committed herd size of 699 cows would include 5 daily employees accessing the site, milk tanker and supply trucks every two days, and truck with stock trailer, for a total of 12 additional vehicle trips per day. Daily traffic along Ala Kinoiki Road and Kōloa Road was 8,000 and 6,500 cars daily; HDF-related traffic would add less than one percent additional trips. These additional trips would have a minimal effect on traffic conditions at County roadways in the surrounding area.

At a contemplated herd size of up to 2,000 cows, an additional 11 vehicle trips per day would access the HDF site, for a total of 23 vehicle trips daily. Projections for daily vehicle movements in 2035 for Ala Kinoiki Road and Kōloa Road are 7,200 and 9,500 daily vehicles. HDF-related traffic would add less than one percent. These additional trips would have a minimal effect on traffic conditions at County roadways in the surrounding area. Traffic data is presented in the Draft EIS Sections 4.18 and 4.24.

Construction equipment mobilization will comply with Hawaiʻi Department of Transportation and County requirements. Delivery trucks and milk tanker trucks will be in compliance with State and County size and weight limits; no oversized vehicles will be used for ongoing operations.

AIR QUALITY: As a part of the Environmental Impact Statement (EIS), existing air quality conditions and project impacts were evaluated, including dust and odor. Potential odors and emission levels for air pollutants relevant to dairy operations were modeled, as currently there are no cows on site. EIS sections 4.19 and 4.25 provide an evaluation of air quality and odors, including a windrose depicting wind speed and direction in the area (see DEIS Section 4.1, Climate). The full air quality technical report can be found in Draft EIS Appendix I.

Clean Air Act

Under the *Clean Air Act of 1970* (CAA), amended November 1990, the U.S. Environmental Protection Agency (EPA) regulates both large and small sources of air pollutants by establishing National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. The State of Hawaiʻi has established its own *State Ambient Air Quality Standards* (SAAQS) that are as strict or, in some cases more strict than the NAAQS. State standards prohibit any visible emissions of fugitive dust from construction activities at the property line.

Emissions relevant to livestock operation include particulate matter and fugitive dust. Greenhouse gases related to dairy cows include methane (CH_4) from enteric fermentation, and both methane and nitrous oxide (N_20) emissions from manure application. No State or Federal regulations for greenhouse gas emissions from farm operations or small businesses currently exist.

DUST

Dust will be generated as cows move along soft limestone walkways that connect the paddocks and lead to and from the milking parlor. Potential fugitive dust emission rates were estimated from published literature, where particulate matter (PM) is measurable from the "drylots" of confined dairy operations where animals walk over dirt and dried manure throughout the day.

Applying the emission rates from this available literature greatly overestimates potential emission resulting from HDF. Cows in the pastoral rotational-grazing system will be on pasture 22 hours each day and will spend two hours – in two separate milking cycles –moving to and from the barn for the 10- to 15-minute milking sessions.

Using atmospheric dispersion modeling system (AERMOD), the rates were scaled to the size of the non-pasture areas used by cows at HDF. Results were added to the background concentration of particulate matter (both PM_{10} and $PM_{2.5}$) measured on the island of Kauaʻi, and the total concentration was compared to the State ambient air quality standards. Only the contemplated herd size of up to 2,000 mature dairy cows was modeled, as at the lower threshold of 699 cows, the potential fugitive dust impact would be negligible. The estimated concentration for PM_{10} is 2.01 $\mu g/m^3$, well below the State standard of 150 $\mu g/m^3$. The estimated concentration for $PM_{2.5}$ is 0.23 $\mu g/m^3$, well below the Federal standard of 35 $\mu g/m^3$ (see Draft EIS Section 4.19 and Table 4-19.2).

ODOR

Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF, so air dispersion models were used to determine potential odor levels. Local weather data was used in conjunction with the AERMOD modeling system, and published rates for manure odors emissions for dairy heifers and effluent ponds were adapted to reflect the HDF facilities.

Odor emission sources identified for modeling at HDF were manure in the pasture fields, irrigation water containing diluted nutrients from effluent, the effluent storage ponds, and the dairy buildings. Odor rates from published research were applied. Odor isopleths (a line used to map all points having the same numerical value) were created to display the model findings. Odor is described in "odor units" at the threshold of perception, which is defined by the point at which 50 percent of panelists, in laboratory conditions, cannot smell the odor but 50 percent of the panelists can detect the odor.

Modeling results were generated for worst case meteorological conditions (low wind velocity / mixing). Generally, tradewinds will disperse odors to less than detectable levels beyond the HDF site; in periods of no wind, odor may not be dispersed creating the "worst case" scenario. In these periods without normal tradewind flow, the odor plume would extend to the south of the HDF site. Sections 4.19.2 and 4.25.2 of the EIS include graphics of the potential odor isopleths.

Results for the committed herd size of 699 mature dairy cows show that odors may be detectable by 50 percent of the sensitive population once per 200 hours, or 44 hours per year, within an area that extends approximately 1,670-feet (within one-third of a mile) beyond the dairy farm boundary, and does not reach recreational or residential areas. Results for the contemplated expanded herd size of up to 2,000 mature dairy cows show odors would not extend beyond 2,780 feet outside the HDF boundary (just over half a mile), again not reaching recreational or residential areas, and again with detection limited to 50 percent of the sensitive population approximately 44 hours per year. The parameters used in the analysis were intentionally conservative, and the impacts shown assume an unlikely confluence of worst-case meteorological data, irrigation location, and grazing location. Actual offsite odor impacts are likely to be much lower and/or less frequent than shown; it is likely odor detection beyond the HDF boundaries will be less frequent.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

GREAT VACATION RETREATS
The World Away

February 19, 2015

Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, HI 96813

To Whom It May Concern:

I am writing as a concerned citizen and business owner in Poipu, Kauai that would be greatly affected by the proposed Hawaii Dairy Farm site near the coastline of Maha'ulepu. Should a dairy farm be allowed to put cows near an already contaminated stream it could not only affect the marine life in our small community, but our island's entire economy. Our main source of income for the island is tourism. The proposed dairy site is on one of the most pristine destinations on our island with historical significance and the home to endangered species. I personally live in the area that would be affected by the constant smell of feces and flies as do the majority of my employees. My husband and I also own a vacation rental management company with the majority of our properties in the Poipu area. I can say for certain that NO ONE will want to stay in Poipu if they have to endure that kind of environment. They will go to Maui or perhaps not even come to Hawaii at all. As a licensed real estate broker on Kauai I know that our overall property values will also be greatly diminished.

I strongly urge you to oppose the construction of a commercial dairy farm at Maha'ulepu.

Sincerely,

Amy Grant, R

May 26, 2016

Amy Grant
P.O. Box 98
Koloa, HI 96756

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Amy Grant:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

DEMOGRAPHIC AND ECONOMIC: The potential impacts of Hawai'i Dairy Farms (HDF) to the existing economy were evaluated in the Draft Environmental Impact Statement (EIS), including a fiscal impact assessment report completed in April, 2016 by Plasch Economics Pacific. Draft EIS Section 4.15 addresses demographic and economic factors, with the complete report in Appendix J.

The HDF project would create short-term benefits through jobs for local construction personnel and local material suppliers. Such jobs would include equipment operators, cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, supervisors, painters, etc. Based on State employment multipliers, indirect employment related to Dairy construction would be expected to average about 16 jobs on Kaua'i, and 8 on O'ahu. Construction employment would be expected to average about 12 jobs per year during the

development period. Thus direct-plus-indirect employment association with construction would be expected to average approximately 36 jobs, of which 28 would be on Kaua'i.

The HDF project would contribute to diversification of Kaua'i's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Hawai'i Island), approximately10 percent of Hawai'i's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and indirect full-time equivalent jobs on Kaua'i, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on O'ahu.

HDF is expected to generate a net income of approximately $68,000 to the County when the 699 cow herd is established. When the dairy has matured to full production for the 699 cow dairy, net income to the State is calculated at $160,000 annually. With the potential contemplated herd size of up to 2,000 mature dairy cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be produced. This would double local milk production currently supplied by operational dairies on the Island of Hawai'i.

Additional employment generated by a possible expansion to accommodate the contemplated 2,000 mature dairy cow herd is estimated at approximately 3 construction jobs plus 4 indirect jobs on Kaua'i, and 2 indirect jobs on O'ahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an additional 5 full-time farm jobs would be added, with approximately 15 additional indirect jobs on Kaua'i and another 8 indirect jobs on O'ahu.

The dairy is expected to generate a net additional contribution to the County of approximately $8,000 for improvements related to expansion for the contemplated herd size of up to 2,000 mature dairy cows ($76,000 total versus $68,000 for the committed herd size). The State will derive approximately $360,000 annually in revenues from the contemplated 2,000-mature dairy cow dairy.

Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E

and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

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The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhāʻulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Poʻipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

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plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhāʻulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhāʻulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

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through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhāʻulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

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The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

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AIR QUALITY: As a part of the Environmental Impact Statement (EIS), existing air quality conditions and project impacts were evaluated, including dust and odor. Potential odors and emission levels for air pollutants relevant to dairy operations were modeled, as currently there are no cows on site. EIS sections 4.19 and 4.25 provide an evaluation of air quality and odors, including a windrose depicting wind speed and direction in the area (see DEIS Section 4.1, Climate). The full air quality technical report can be found in Draft EIS Appendix I.

Clean Air Act

Under the *Clean Air Act of 1970* (CAA), amended November 1990, the U.S. Environmental Protection Agency (EPA) regulates both large and small sources of air pollutants by establishing National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. The State of Hawai'i has established its own *State Ambient Air Quality Standards* (SAAQS) that are as strict or, in some cases more strict than the

NAAQS. State standards prohibit any visible emissions of fugitive dust from construction activities at the property line.

Emissions relevant to livestock operation include particulate matter and fugitive dust. Greenhouse gases related to dairy cows include methane (CH_4) from enteric fermentation, and both methane and nitrous oxide (N_20) emissions from manure application. No State or Federal regulations for greenhouse gas emissions from farm operations or small businesses currently exist.

DUST

Dust will be generated as cows move along soft limestone walkways that connect the paddocks and lead to and from the milking parlor. Potential fugitive dust emission rates were estimated from published literature, where particulate matter (PM) is measurable from the "drylots" of confined dairy operations where animals walk over dirt and dried manure throughout the day.

Applying the emission rates from this available literature greatly overestimates potential emission resulting from HDF. Cows in the pastoral rotational-grazing system will be on pasture 22 hours each day and will spend two hours – in two separate milking cycles –moving to and from the barn for the 10- to 15-minute milking sessions.

Using atmospheric dispersion modeling system (AERMOD), the rates were scaled to the size of the non-pasture areas used by cows at HDF. Results were added to the background concentration of particulate matter (both PM_{10} and $PM_{2.5}$) measured on the island of Kaua'i, and the total concentration was compared to the State ambient air quality standards. Only the contemplated herd size of up to 2,000 mature dairy cows was modeled, as at the lower threshold of 699 cows, the potential fugitive dust impact would be negligible. The estimated concentration for PM_{10} is 2.01 $\mu g/m^3$, well below the State standard of 150 $\mu g/m^3$. The estimated concentration for $PM_{2.5}$ is 0.23 $\mu g/m^3$, well below the Federal standard of 35 $\mu g/m^3$ (see Draft EIS Section 4.19 and Table 4-19.2).

ODOR

Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF, so air dispersion models were used to determine potential odor levels. Local weather data was used in conjunction with the AERMOD modeling system, and published rates for manure odors emissions for dairy heifers and effluent ponds were adapted to reflect the HDF facilities.

Odor emission sources identified for modeling at HDF were manure in the pasture fields, irrigation water containing diluted nutrients from effluent, the effluent storage ponds, and the dairy buildings. Odor rates from published research were applied. Odor isopleths (a line used to map all points having the same numerical value) were created to display the model findings. Odor is described in "odor units" at the threshold of perception, which is defined by the point at which 50 percent of

panelists, in laboratory conditions, cannot smell the odor but 50 percent of the panelists can detect the odor.

Modeling results were generated for worst case meteorological conditions (low wind velocity / mixing). Generally, tradewinds will disperse odors to less than detectable levels beyond the HDF site; in periods of no wind, odor may not be dispersed creating the "worst case" scenario. In these periods without normal tradewind flow, the odor plume would extend to the south of the HDF site. Sections 4.19.2 and 4.25.2 of the EIS include graphics of the potential odor isopleths.

Results for the committed herd size of 699 mature dairy cows show that odors may be detectable by 50 percent of the sensitive population once per 200 hours, or 44 hours per year, within an area that extends approximately 1,670-feet (within one-third of a mile) beyond the dairy farm boundary, and does not reach recreational or residential areas. Results for the contemplated expanded herd size of up to 2,000 mature dairy cows show odors would not extend beyond 2,780 feet outside the HDF boundary (just over half a mile), again not reaching recreational or residential areas, and again with detection limited to 50 percent of the sensitive population approximately 44 hours per year. The parameters used in the analysis were intentionally conservative, and the impacts shown assume an unlikely confluence of worst-case meteorological data, irrigation location, and grazing location. Actual offsite odor impacts are likely to be much lower and/or less frequent than shown; it is likely odor detection beyond the HDF boundaries will be less frequent.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

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Jeffrey H. Overton, AICP, LEED AP
Principal Planner

Hawai'i Dairy Farms
MAHA'ULEPU, KAUA'I

RECEIVED
FEB 24 2015
GROUP 70 INTL

ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE

An Environmental Impact Statement (EIS) is being prepared voluntarily by the Applicant to assess potential environmental impacts and mitigation measures associated with agricultural operations at Hawai'i Dairy Farms (HDF) at Māhā'ulepū, Kaua'i.

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1. to allow individuals and groups to request to become a consulted party; and
2. to provide written comment regarding effects of the proposed action.

NOTE: Submitted comments will be published in the Draft EIS

COMMENT

Name: JIM HADWIN Organization: SELF

Preferred contact Method
Email: jkhadwin@hotmail.com Postal Address: 2640 PUOHOLO RD #114 KOLOA
Phone: (Optional)

Comments: It is a matter of record that the stream adjacent to the Sink Hole contains contaminants presently well in excess of State allowable standards. What will HDF do to mitigate that situation & bring the contaminant level below allowable standards, prior to the introduction of additional livestock ???

James J Hadwin
2/20/

Return to:
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Attn: HDF Project
Honolulu, HI 96813
hdf@group70int.com

And/or:
Hawaii State Department of Health
Environmental Planning Office
919 Ala Moana Boulevard, Rm. 312
Honolulu, HI 96814
epo@doh.hawaii.gov

Deadline: February 23, 2015

May 26, 2016

Jim Hadwin
2640 Puuholo Road, #114
Koloa, HI 96756
jkhadwin@bigsky.net

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Jim Hadwin:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali

formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhā'ulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhā'ulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Po'ipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhā'ulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawai'i Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhā'ulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhā'ulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of

groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhāʻulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kauaʻi community.

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Jeffrey H. Overton, AICP, LEED AP
Principal Planner

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FEB 24 2015

GROUP 70 INTL

Hawai'i Dairy Farms

MAHA'ULEPU, KAUA'I

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COMMENT

Name: Kathleen Hadwin Organization: N/A - Resident

Preferred contact Method

Email: mcgram@bigsky.net Postal Address: 2640 Puuholo Rd, #114

Phone: (Optional) 406-249-4184 Koloa, HI 96756

Comments: Please do NOT allow Hawai'i Dairy Farms To use the Mahaulepu area for their business. There is no way To "grass feed" over 600 cows on 578 acres. There is absolutely no way To guarantee "zero discharge" into The soil, stream and ocean. During floods and heavy rains the holding ponds will spill over. If a few cattle were grazing on this land The plan would most likely work. With the number of cows planned, and most will be pregnant when they arrive, there is now way The land and area will not be ruined.

PLEASE ALLOW MAHAULEPU TO REMAIN THE UNIQUE AND BEAUTIFUL PLACE IT IS TODAY.

Thank You, Kathleen Hadwin

Return to:
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Attn: HDF Project
Honolulu, HI 96813
hdf@group70int.com

And/or:
Hawaii State Department of Health
Environmental Planning Office
919 Ala Moana Boulevard, Rm. 312
Honolulu, HI 96814
epo@doh.hawaii.gov

Deadline: February 23, 2015

GROUP 70 INTERNATIONAL

May 26, 2016

Kathleen Hadwin
2640 Puuholo Road, #114
Koloa, HI 96756
mcgram@bigsky.net

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Kathleen Hadwin:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

DAIRY OPERATIONS: Hawai'i Dairy Farms (HDF) will establish and operate a sustainable, pastoral rotational-grazing dairy farm in Māhā'ulepū Valley on the island of Kaua'i to produce fresh, locally available nutritious milk for Hawai'i families. The rotational-grazing method utilizes 100 percent of the cows' manure as natural fertilizer to grow pasture grass as a primary source of nutrition for dairy cows. This cost-effective method will reduce reliance on imported fertilizer and feed. Pasture grass will comprise at least 70 percent of the animals' diet. As a part of the Draft Environmental Impact Statement (EIS), the proposed facilities and operations for the dairy farm are described in Chapter 3.

The Environmental Impact Statement (EIS) Preparation Notice (EISPN), published January 23, 2015, described the proposed pasture-based rotational grazing system

as a "zero-discharge, grass-fed dairy". The term "zero-discharge" under the U.S. Environmental Protection Agency related to concentrated feeding operations (CAFO) is a system designed to not discharge pollutants into waters of the United States. As noted previously, the HDF system is designed to utilize 100 percent of the cows' manure on-site. However, nutrients would be introduced to the HDF site with any use; the Draft EIS identifies the amount of nutrients anticipated from the proposed dairy operations that could pass through to ground and surface waters. Therefore, HDF elected to discontinue use of the term "zero discharge" as it was construed as no nutrients into the system.

The term "grass-fed" was used in the HDF EISPN. This term was used to identify HDF's intent to utilize a locally-produced feedstock – grass – for more than 70 percent of the dairy herds' diet. In January 2016, the U.S. Department of Agricultural (USDA) Marketing Survey created a narrow legal definition of "grass-fed". The USDA standard defines what animals can and cannot be fed. The Food Alliance, a project of several northwest colleges, believes that when consumers choose grass-fed products there is an expectation that these will come from animals raised on pasture on a forage-based diet. Due to the evolving definition of "grass-fed", the term in not used in this EIS.

The dairy facilities will occupy an area of approximately 10 acres on the western boundary of the site. The developed area "footprint" will be less than 2 percent of the total farm area. Four buildings will be constructed to serve different functions, supported by utilities and infrastructure. Additional building information can be found in Draft EIS Section 3.3.1.

Agricultural infrastructure and utilities required for the dairy operations will include storage tanks and silos, effluent storage ponds, livestock water systems, and drainage improvements. The irrigation system and distribution of livestock water are discussed in Draft EIS Section 3.5, Pasture Management.

The pastoral rotational-grazing dairy provides a local feedstock – grass – as the herd's primary food source. Reducing imported feed stabilizes costs and provides a food source closer to the natural diet of cows. Results of grass trials initially conducted at five sites across four Hawaiian Islands were instrumental in identifying appropriate varieties of grass, and suitable sites to support sufficient "dry matter" grass yields essential to a cow's diet. Additional project-specific trials at the Māhāʻulepū site on Kauai have been conducted for more than 18 months. The results have identified sufficient yield and nutrition to supply 70 percent of the cows' diet; improvements in grass productivity are anticipated to provide up to 85 percent of cows' diet.

The pasture-based model allows cows to move about freely, and to lie down and rest, which is part of the digestion cycle. The animals are managed in social groups known as "mobs", mimicking the natural social order of bovines. Cows spend 22 hours of each 24-hour period foraging on pasture or resting, outdoors in natural light and fresh air. The gently sloped paddocks, walkways and races minimize the energy expended by the mature dairy cows as they graze or are transferred to and from the various paddocks and the mature dairy facility; surfaces of the walkways

and cow races are designed to provide a comfortable path under hoof. The management practices and pasture model applied by HDF maximizes grass as the cows' primary nutrition source and minimizes stress to the animals. Cows tend to be healthier and live longer, productive lives with access to fresh air, high quality feed, and exercise while they forage.

The 470 acres of pasture will be divided into paddocks averaging 3 to 5 acres in size. Smaller paddocks located near the dairy facility will be used as temporary pasture for cows or calves being moved on or off the farm. To protect the water quality of surface water and downstream areas, paddock fences are set back 35 feet from the edge of drainage ways throughout the site. Existing vegetation within the setbacks will be managed or restored to reduce erosion, improve stability of ditch banks, increase net carbon storage, and improve and maintain water quality.

The majority of the pastures will be irrigated with non-potable water and/or diluted effluent through either the pivot irrigation systems or through gun irrigators. Irrigation water supply is provided to the farm from Waita Reservoir, and will be filtered and pumped to the various irrigation components on the farm. The irrigation system is controlled using computer software and GPS receivers to allow very precise application of irrigation and/or diluted effluent on the pasture. The pivots can rotate and apply irrigation water and/or diluted effluent at different rates depending on the actual irrigation needs of the farm.

NRCS provides technical guidance on applying agricultural waste depending on the desired use of the waste. Reflected in the title of the livestock waste guidance for Hawaiʻi is the parenthetical inclusion of the word "nutrients." Where waste is utilized as a resource, it is being used for the constituent components that provide benefit.

The NRCS Conservation Practice Standard 590, Nutrient Management, applies to commercial fertilizers, organic by-products, waste water, organic matter, and irrigation water. Nutrient management is the practice of managing the amount, rate, source, method of application, and timing of plant nutrients and soil amendments. The timing and application of nutrients will correspond with plant uptake, soil properties and weather conditions. For more information on nutrient balance management see Draft EIS Section 3.5.3, and Draft EIS Appendix D.

The effluent storage ponds are sized to accommodate 30 days of storage for up to 2,000 mature dairy cows, and over 85 days of storage for 699 mature dairy cows. It will be highly unlikely that the storage pond will be full at any time for the contemplated 2,000-cow dairy, and nearly impossible for the committed 699-cow dairy. Throughout the less than 30-day storage period, effluent is planned for application every four days, and the slurry application is expected at least once every 45 days, to ensure that the ponds are kept at manageable levels.

Cows lactate milk following the birth of calves. Newborn calves will be housed on the Māhāʻulepū site and provided essential colostrum and nutrients for a healthy start. During the calves' initial 90 days, they will be transitioned to pasture at HDF before transfer to ranches on Kauaʻi to be raised off-site. The committed herd size of

699 mature dairy cows at the Māhāʻulepū site applies to mature mature dairy cows. Animals in various stages of lactation and rest will be transferred between HDF and other partner ranches as needed for animal health and dairy productivity. This will benefit both the dairy and infuse the beef market in Hawaiʻi with a new, local source of pasture-raised calves. Male calves will become part of the beef cattle herd; heifers (young female calves that haven't given birth) will be raised until ready to return to the HDF herd as a birthing/mature dairy cow. For more information on off-site herd management, refer to Section 3.7 of the Draft EIS.

Health of the herd is of primary importance as the success of a dairy relies on cows effectively producing quality milk. All cows will be treated with a high standard of care. Dairy managers and caretakers will be trained and competent in handling animals to minimize stress and ensure the herds' welfare. A licensed veterinarian may prescribe use of antibiotics approved by the Food & Drug Administration (FDA) for treatment of illnesses. Adherence to guidelines that prohibit milk from cows undergoing antibiotic treatment will ensure no adulteration of milk. Routine laboratory tests of milk for traces of antibiotic residue will be conducted. HDF will not inject cows with bovine growth hormone, referred to as rBST or rBGH.

NATURAL HAZARDS: The potential impacts of natural hazards are evaluated in the Draft Environmental Impact Statement (EIS), including flooding, tsunami, earthquakes, and hurricanes. Draft EIS Section 4.6 addresses natural hazards.

The Māhāʻulepū property is not known to experience flooding conditions. The area is located within Federal Emergency Management Agency (FEMA) Zone X, areas determined to be outside the 0.2% annual chance floodplain. The proposed location for Hawaiʻi Dairy Farms (HDF) lies between the 60 and 150 feet elevation, outside the tsunami evacuation zone. The Kauaʻi and Niʻihau region of the Hawaiian Islands has experienced tremors from earthquakes originating further south in the island chain, but no known seismic activity has originated among these northern islands.

Although they occur infrequently, Kauaʻi has received a greater amount of damage from hurricanes when compared to the other Hawaiian Islands. Land management personnel in the Māhāʻulepū region during and following the hurricanes that affected Kauaʻi in 1982 and 1992 observed defoliation of vegetation, and no flooding events in the period following passage of the storms.

Preparedness is the best protection for natural disasters. Structural design of dairy facilities will meet International Building Code (IBC) 2006 standards with local amendments. Provisions in design will address wind loading (including hurricane gusts), rain and flood loading, and earthquake loading. A geotechnical evaluation of the area recommended Seismic Site Class D under IBC standards be utilized for foundation design where the barns and agricultural infrastructure will be constructed.

There has been no rainfall event that would exceed the capacity of the effluent ponds since rainfall has been recorded in Māhāʻulepū Valley. The effluent pond capacity has been designed above the regulatory requirement to contain the 25-year, 24-hour rainfall event. An emergency containment berm with additional

capacity for another 30 days is included in the design. This design exceeds regulatory requirements, with containment in excess of the major rainfall events recorded on Kauaʻi over the past three decades.

An emergency preparedness plan for protection of animals has been prepared for HDF internal use that addresses hurricane, fire, and potential flooding hazard scenarios. HDF is not in a tsunami inundation area, so this scenario is not planned for in the disaster plan. The disaster plan relies upon knowledge of cow behavior, and is based on extensive guidance for livestock protection from NRCS, the Florida State Agricultural Response Team (SART), Pennsylvania State College of Agricultural Sciences, and Cornell University Cooperative Extension. The plan includes safety procedures during any disaster, follow up actions, and emergency contacts for assistance before, during or following the event. Further information is provided in the Draft EIS Section 4.6.2.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawaiʻi Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhāʻulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhāʻulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Poʻipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhāʻulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawaiʻi Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhāʻulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhāʻulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhāʻulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kauaʻi community.

Regional Water Demand: The adjacent, developed Kōloa-Poʻipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kauaʻi will increase county-wide by 17,300 residents by 2030. The South Kauaʻi population is estimated to reach 16,855 in 2035, when it is projected to

encompass 19.2 percent of the County population. For the South Kauaʻi region (the Kōloa - Poʻipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhāʻulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhāʻulepū watershed.

The HDF site is located on the bottom-land of the upper Māhāʻulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Haʻupu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhāʻulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kauaʻi Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhāʻulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhāʻulepū and adjacent watersheds. DOH conducted water sampling

within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhāʻulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three

times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Poʻipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at

levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kaua'i community.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

From: Beth Hagan
To: HDF
Subject: Comments on proposed dairy farm
Date: Monday, February 23, 2015 10:44:06 AM

To Whom it May Concern:

I'm writing to express my opposition to the dairy farm proposed in the Maha'ulepu Valley as it is currently structured. While I appreciate the intention of promoting sustainable food practices for Kauai, I don't feel a dairy of the size proposed is appropriate for this special island. I won't go into all the reasons for opposing this operation…I know you have heard them from people more knowledgeable and eloquent than I…but I *did* want to participate in letting my concerns be known to those in decision-making positions!

Please take great care and consideration in determining if and how this plan should go forward. Kauai is an extremely unique gem on this planet and I do believe it can be a shining example to the world of how sustainability can be done RIGHT (and preferably organically, in my humble opinion). Please don't just green-wash with all the right words; truly examine all the motives behind your decisions and do the right thing.

Mahalo for your time and consideration,
Beth Hagan

May 26, 2016

Beth Hagan
bethhagan@hotmail.com

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

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The pasture-based model allows cows to move about freely, and to lie down and rest, which is part of the digestion cycle. The animals are managed in social groups known as "mobs", mimicking the natural social order of bovines. Cows spend 22 hours of each 24-hour period foraging on pasture or resting, outdoors in natural light and fresh air. The gently sloped paddocks, walkways and races minimize the energy expended by the mature dairy cows as they graze or are transferred to and from the various paddocks and the mature dairy facility; surfaces of the walkways and cow races are designed to provide a comfortable path under hoof. The management practices and pasture model applied by HDF maximizes grass as the cows' primary nutrition source and minimizes stress to the animals. Cows tend to be

healthier and live longer, productive lives with access to fresh air, high quality feed, and exercise while they forage.

The 470 acres of pasture will be divided into paddocks averaging 3 to 5 acres in size. Smaller paddocks located near the dairy facility will be used as temporary pasture for cows or calves being moved on or off the farm. To protect the water quality of surface water and downstream areas, paddock fences are set back 35 feet from the edge of drainage ways throughout the site. Existing vegetation within the setbacks will be managed or restored to reduce erosion, improve stability of ditch banks, increase net carbon storage, and improve and maintain water quality.

The majority of the pastures will be irrigated with non-potable water and/or diluted effluent through either the pivot irrigation systems or through gun irrigators. Irrigation water supply is provided to the farm from Waita Reservoir, and will be filtered and pumped to the various irrigation components on the farm. The irrigation system is controlled using computer software and GPS receivers to allow very precise application of irrigation and/or diluted effluent on the pasture. The pivots can rotate and apply irrigation water and/or diluted effluent at different rates depending on the actual irrigation needs of the farm.

NRCS provides technical guidance on applying agricultural waste depending on the desired use of the waste. Reflected in the title of the livestock waste guidance for Hawai'i is the parenthetical inclusion of the word "nutrients." Where waste is utilized as a resource, it is being used for the constituent components that provide benefit.

The NRCS Conservation Practice Standard 590, Nutrient Management, applies to commercial fertilizers, organic by-products, waste water, organic matter, and irrigation water. Nutrient management is the practice of managing the amount, rate, source, method of application, and timing of plant nutrients and soil amendments. The timing and application of nutrients will correspond with plant uptake, soil properties and weather conditions. For more information on nutrient balance management see Draft EIS Section 3.5.3, and Draft EIS Appendix D.

The effluent storage ponds are sized to accommodate 30 days of storage for up to 2,000 mature dairy cows, and over 85 days of storage for 699 mature dairy cows. It will be highly unlikely that the storage pond will be full at any time for the contemplated 2,000-cow dairy, and nearly impossible for the committed 699-cow dairy. Throughout the less than 30-day storage period, effluent is planned for application every four days, and the slurry application is expected at least once every 45 days, to ensure that the ponds are kept at manageable levels.

Cows lactate milk following the birth of calves. Newborn calves will be housed on the Māhā'ulepū site and provided essential colostrum and nutrients for a healthy start. During the calves' initial 90 days, they will be transitioned to pasture at HDF before transfer to ranches on Kaua'i to be raised off-site. The committed herd size of 699 mature dairy cows at the Māhā'ulepū site applies to mature mature dairy cows. Animals in various stages of lactation and rest will be transferred between HDF and other partner ranches as needed for animal health and dairy productivity. This will

benefit both the dairy and infuse the beef market in Hawai'i with a new, local source of pasture-raised calves. Male calves will become part of the beef cattle herd; heifers (young female calves that haven't given birth) will be raised until ready to return to the HDF herd as a birthing/mature dairy cow. For more information on off-site herd management, refer to Section 3.7 of the Draft EIS.

Health of the herd is of primary importance as the success of a dairy relies on cows effectively producing quality milk. All cows will be treated with a high standard of care. Dairy managers and caretakers will be trained and competent in handling animals to minimize stress and ensure the herds' welfare. A licensed veterinarian may prescribe use of antibiotics approved by the Food & Drug Administration (FDA) for treatment of illnesses. Adherence to guidelines that prohibit milk from cows undergoing antibiotic treatment will ensure no adulteration of milk. Routine laboratory tests of milk for traces of antibiotic residue will be conducted. HDF will not inject cows with bovine growth hormone, referred to as rBST or rBGH.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

From: Pat Hagan
To: HDF
Subject: Dairy Farm
Date: Monday, February 23, 2015 11:07:07 AM

To Whom it May Concern,

I'm writing to express my opposition to the proposed dairy farm at Maha'ulepu. It seems to me that if the goal is to do something sustainable, the amount of cattle on the land is truly more of a gamble than sustainable. If you want to do something agricultural (and cattle and agriculture are two different things) with an ecologically minimal impacts, why not do something with native plants and do it organically?

Let's think very, very long term.

Sincerely,
Pat Hagan

GROUP 70 INTERNATIONAL

May 26, 2016

Pat Hagan
twomedgrill@hotmail.com

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Pat Hagan:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

DAIRY OPERATIONS: Hawai'i Dairy Farms (HDF) will establish and operate a sustainable, pastoral rotational-grazing dairy farm in Māhā'ulepū Valley on the island of Kaua'i to produce fresh, locally available nutritious milk for Hawai'i families. The rotational-grazing method utilizes 100 percent of the cows' manure as natural fertilizer to grow pasture grass as a primary source of nutrition for dairy cows. This cost-effective method will reduce reliance on imported fertilizer and feed. Pasture grass will comprise at least 70 percent of the animals' diet. As a part of the Draft Environmental Impact Statement (EIS), the proposed facilities and operations for the dairy farm are described in Chapter 3.

The Environmental Impact Statement (EIS) Preparation Notice (EISPN), published January 23, 2015, described the proposed pasture-based rotational grazing system as a "zero-discharge, grass-fed dairy". The term "zero-discharge" under the U.S. Environmental Protection Agency related to concentrated feeding operations

(CAFO) is a system designed to not discharge pollutants into waters of the United States. As noted previously, the HDF system is designed to utilize 100 percent of the cows' manure on-site. However, nutrients would be introduced to the HDF site with any use; the Draft EIS identifies the amount of nutrients anticipated from the proposed dairy operations that could pass through to ground and surface waters. Therefore, HDF elected to discontinue use of the term "zero discharge" as it was construed as no nutrients into the system.

The term "grass-fed" was used in the HDF EISPN. This term was used to identify HDF's intent to utilize a locally-produced feedstock – grass – for more than 70 percent of the dairy herds' diet. In January 2016, the U.S. Department of Agricultural (USDA) Marketing Survey created a narrow legal definition of "grass-fed". The USDA standard defines what animals can and cannot be fed. The Food Alliance, a project of several northwest colleges, believes that when consumers choose grass-fed products there is an expectation that these will come from animals raised on pasture on a forage-based diet. Due to the evolving definition of "grass-fed", the term in not used in this EIS.

The dairy facilities will occupy an area of approximately 10 acres on the western boundary of the site. The developed area "footprint" will be less than 2 percent of the total farm area. Four buildings will be constructed to serve different functions, supported by utilities and infrastructure. Additional building information can be found in Draft EIS Section 3.3.1.

Agricultural infrastructure and utilities required for the dairy operations will include storage tanks and silos, effluent storage ponds, livestock water systems, and drainage improvements. The irrigation system and distribution of livestock water are discussed in Draft EIS Section 3.5, Pasture Management.

The pastoral rotational-grazing dairy provides a local feedstock – grass – as the herd's primary food source. Reducing imported feed stabilizes costs and provides a food source closer to the natural diet of cows. Results of grass trials initially conducted at five sites across four Hawaiian Islands were instrumental in identifying appropriate varieties of grass, and suitable sites to support sufficient "dry matter" grass yields essential to a cow's diet. Additional project-specific trials at the Māhāʻulepū site on Kauai have been conducted for more than 18 months. The results have identified sufficient yield and nutrition to supply 70 percent of the cows' diet; improvements in grass productivity are anticipated to provide up to 85 percent of cows' diet.

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cows' primary nutrition source and minimizes stress to the animals. Cows tend to be healthier and live longer, productive lives with access to fresh air, high quality feed, and exercise while they forage.

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FLORA AND FAUNA: Botanical, avian, and mammalian surveys of the property were conducted for the Draft Environmental Impact Statement (EIS) to assess existing species on site, including identifying any species listed as endangered, threatened, or proposed under any state or federal endangered species programs in or near the property. EIS Sections 4.9 and 4.10 address the evaluation of flora and fauna resources, with technical studies in Appendix A and B.

A botanical survey of the dairy property was conducted in August 2014 by AECOS Consulting to assess existing plant species. The survey also investigated for the presence of plants currently listed as endangered, threatened or proposed for listing under Federal or the State of Hawai'i's endangered species programs, located onsite or within the immediate vicinity of the dairy site. The nature of the land and its present and historical uses for intensive agriculture very much limit the natural botanical resources anticipated to occur on this land. Complete species lists are included in the EIS, and no protected botanical species occur on the project property. The project will include vegetated buffer strips along the drainage ways as part of the Conservation Plan to reduce erosion and stabilize slopes. Where native plants occur or could survive if planted, native plants will be used in the stabilization. No long-term impacts to native plant habitats or endangered or threatened plants species will occur as a result of the dairy.

Avian and mammalian surveys were conducted in August 2014 by Rana Biological Consulting, Inc. This survey was conducted to assess the potential presence of avian or mammalian species currently listed as endangered, threatened or proposed for listing under either Federal or the State endangered species lists. The survey covered the dairy site area and immediate vicinity. Common birds and terrestrial mammals were encountered on the property. There is no critical habitat for endangered species in the upper Māhā'ulepū Valley.

Four species of endangered waterbirds were recorded on the site and at the nearby taro farm located within the HDF site. Though the area does not provide critical habitat, seabirds that nest in upland areas of Kauai may overfly the site. The

endangered Hawaiian goose, nēnē was also seen on the site. State Division of Forestry and Wildlife biologists have noted nēnē are regularly seen on the subject property. It is probable that some nest on or adjacent to the site as this species nests in the general Kōloa area, and the habitat present on parts of the site is suitable for nēnē nesting.

The principal potential impacts posed to the five endangered species include those potentially associated with construction activities, and those associated with dairy farm operations following build-out. Measures will be adopted to avoid potential seabird and nēnē goose collisions with fences and structures. Potential measures include lowering construction cranes at night, using conservation fencing to project-specified areas, marking tall structures and fencing with white visibility polytape, limiting nighttime lighting, and shading any outside lights used at night. Ongoing mitigation strategies will be implemented for day-to-day preventative measures, including an Avian Species Protection Plan. Mitigation measures are further described in DEIS Section 4.10.2.

It is also likely that Hawaiian hoary bats overfly the project area on a seasonal basis. While caution will be taken during any potential disturbance or vegetation removal, there are almost no suitable roost trees within the dairy site, thus it is expected that the dairy farm will not affect this listed mammalian species.

ALTERNATIVES: As a part of the DEIS, alternatives were evaluated that could attain the objectives of the action's purpose and need, and were compared with environmental benefits, costs, and risks of each reasonable alternative against those of the proposed dairy project. Further discussion of alternatives can be found in DEIS Section 6.

The DEIS evaluates alternatives that could attain the objectives of the action's purpose and need, and compares environmental benefits, costs, and risks of each reasonable alternative against those of the proposed action. Additionally, reasonable land use alternatives that emerged from public input during the project scoping phase are documented and briefly discussed. The alternatives that do not meet the project purpose are not advanced for analysis of environmental benefits, costs, and risks. The Environmental Impact Statement Rules, Hawai'i Administrative Rules Chapter 11-200 (HRS 11-200) requires a discussion of alternatives that could attain the objectives of the action, regardless of cost. There is no requirement for the alternatives analysis to consider every possible land use.

Four possible land uses that would not meet the project purpose are discussed. Rezoning the land for resort or residential development, or a potential conservation condemnation are two uses that were examined and eliminated from analysis. These options would not be reasonably viable given the existing private land tenure and existing zoning. Two additional alternatives were considered as reasonable land uses as they could be permitted within the existing State Land Use Agricultural District and County Agricultural Zoning District. These options include Agricultural Park with Processing Center, and development of an Agricultural Subdivision. The alternatives were examined and eliminated from further analysis, however, as they would not fulfill the project purpose.

The analysis, therefore, focuses on alternatives that meet the project purpose. Rigorous exploration and evaluation of the environmental impacts of the alternatives, including those that might enhance environmental quality or avoid, reduce or minimize some or all of the adverse environmental effects, costs and risks. These alternatives include: (1) the development of a Conventional Feedlot Dairy (a non-pasture-based dairy) at the same location; (2) development of the Pasture-Based Dairy at an Alternative Location on Kaua'i; and (3) milk products processing by HDF. The alternative of "No Action" is also evaluated.

The alternatives analysis provides a comprehensive evaluation of the range of potential alternatives, including the two alternative development scenarios. Although the alternatives are potentially reasonable uses under existing zoning and neighboring uses, each fails to comprehensively fulfill the project requirements defined by the eight Project Objectives and the four established Evaluation Criteria (Chapter 2, Sections 2.3.3 and 2.3.4).

The essential differences as compared to the proposed action are highlighted in the following statements.

- Only one of the alternative actions (conventional feedlot alternative) would create a commercial scale dairy operation in Hawai'i, with the capability to produce 10 percent of the State's fresh milk demand thus reducing dependence on imported milk (Objective 1). This alternative, however, would not reduce reliance on costly imported fertilizer and feed (Objective 2); grow local, quality grass as a primary feedstock (Objective 3); and would not utilize 100 percent of manure on site as nutrients to grow forage for dairy cows (Criterion 4).
- None of the alternatives would secure a dairy location that meets the requirements for a pastoral, pasture-based grazing dairy: sufficient contiguous land area; available long-term land tenure; adequate potable water supply; suitable soil properties; gentle slope conditions; and accessibility (Criterion 1).
- One alternative (Agricultural Park) could potentially generate new long-term employment in the agricultural sector on Kaua'i in a wide range of positions including pasture agronomy/soils science, environmental resources management (Criterion 2).
- The Agricultural Park alternative could also develop sustainable food production utilizing Important Agricultural Lands, demonstrating the importance of long-term agricultural leases and capital investment for agricultural infrastructure, water systems and support facilities. (Criterion 3). However, after years of trying, it appears there was limited interest in such a venture.
- Finally, addressing the range of potential environmental impacts (natural, cultural, social and economic) (Objective 8) the two alternative development scenarios would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.

In contrast to the other options considered, the planned agricultural operation of

Hawai'i Dairy Farms, was determined to be the most viable option and is the preferred alternative. Of all the alternatives considered, this is the only approach that achieves project objectives and meets each of the four Evaluation Criteria.

- Hawai'i Dairy Farms will create a commercial scale pasture-based dairy operation in Hawai'i, with the capability to provide more than 1,000,000 gallons of the fresh milk demand, reducing dependence on imported milk (Objective 1).
- The planned dairy location meets the requirements of minimum land area, soil properties, slope conditions, water supply, land tenure and availability, and accessibility (Criterion 1).
- The planned action will generate new long-term employment in the agricultural sector on Kaua'i, including pasture agronomy/soils science, veterinary and animal husbandry, environmental resources management, milk/milk processing, and dairy business management (Criterion 2).
- Sustainable food production utilizing Important Agricultural Lands (Criterion 3) will occur with the proposed action, demonstrating the importance of long term agricultural leases, and the ability to draw capital investment for agricultural infrastructure including water systems and support facilities (Criterion 3).
- Address the range of potential environmental impacts by utilizing 100 percent of manure as natural fertilizer to grow the majority of food for cows (Criterion 4). The alternatives evaluated would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.
- Creating an economically viable pasture rotational-grazing model maintains agriculture, retains open space, and provides buffer between highly utilized resort and residential development and sensitive natural or cultural resources (Objective 8).

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

From: juliehagensen@comcast.net [mailto:juliehagensen@comcast.net]
Sent: Monday, February 23, 2015 4:42 PM
To: McIntyre, Laura
Cc: juliehagensen@comcast.net; EPO
Subject: HDF Industrial Dairy Proposal

Dear Ms. McIntyre:

Attached please find my letter which expresses my concerns regarding the proposed industrial dairy for the South Shore of Kauai as well as my specific comments on the EISPN.

Thank you for your review and consideration of my comments. As you know, the EISPN is a critical component of the overall EIS process and I value this opportunity to provide my input.

Sincerely,

Julie M. Hagensen
Koloa, HI
(808) 742-6688

February 22, 2015

State of Hawaii, Department of Health

Laura McIntire, Environmental Planning Office

919 Ala Moana Blvd Room 312

Honolulu, HI.

Dear Ms. McIntyre,

This letter is to express my grave concerns regarding the proposed Industrial Dairy on the South Shore of Kauai. I have owned a home in Poipu with my mother for nearly thirty years and am very familiar with site HDF proposes for their operation. I have read their materials thoroughly and have researched information concerning the many problems associated with such a large scale operation – most notably contamination of drinking water, groundwater, surface water and soils. Although effects on the environment and public health are my primary concern, I am also concerned about the economic and community impacts that the industrial dairy will have on the tourist industry, home values, cultural sites, and local business.

I have concluded that Maha'ulepu is the wrong location for such an operation and urge The Department of Health to do the right thing for the environment, the people and businesses of Kauai.

My comments on the EISPN are centered on the potential cumulative effects of an industrial dairy and the areas I feel must be addressed in the EIS.

Criteria 8: Is individually limited but cumulatively has considerable affect upon the environment or involves a commitment for larger actions.

The HDF plan is not individually limited in its effect on the environment, the economy or the social wellbeing of the community. A responsible EIS will need to address the numerous impacts on water, air and soil quality, threatened species, coral reefs and the local economy. Cumulatively, over a relatively short period of time, the HDF operation will compound the negative effects in all these areas.

The HDF plan does involve a commitment to a larger action. According to EIS requirements, any proposed action must be described in its entirety. HDF plans to begin operations with 699 cows to avoid classification as a CAFO and acknowledges plans to grow the herd to 2000 over time. Therefore the EIS must address the ultimate herd size and its management now. Questions such as composition of cows (eg, the mix of dry and milking cows), how all animals (cows, calves, bulls) will be fed, housed, transported, slaughtered (bull calves and non - producing cows), and the management of their wastes must be addressed at the 2000 cow mark.

In addition to the growth and accumulation of pollutants as the herd size increases, other effects from greater numbers must be estimated and addressed. These include but are not limited to: **noise** from bawling and distress calls from cows separated from their calves which can go on 24-7 for days as well as the loud, anxious calls from cows in heat. How far will these noises carry? Data using climatic, wind and geographic conditions of the specific site must be used; **Odor sources and levels** from each and every aspect of the operation from lagoons and wash areas to liquefied manure that is sprayed on the land. Reports from farmers acknowledge that is takes days for the odors to subside and when it rains it begins again. On even slight slopes not only pollution and contaminants are carried off site but also accompanying foul odors. An analysis up to the 2000 cow mark must again be specific to the geography, weather and wind conditions at and near the site. How far will these odors travel on a good day? A bad day? Average wind and climatic conditions will not suffice. The **impacts to soils, groundwater, streams and ocean** from diary wastes including the use of hormones, antibiotics, and vitamins must be again addressed at the 2000 head level.

HDF proposes a zero discharge operation. By its very nature, discharges to lagoons, run off from cleaning and milking operations and direct discharges from cows on sloped lands cannot be viewed as a “zero discharge” and will, together, have a cumulative impact to underground water resources, streams, ditches, beaches, and ocean below. To consider the thousands of sources of pollution from this operation as “nonpoint” is also a misnomer. For each contaminant there is a source. Obtaining a zero discharge NPDES permit is not useful in this case as it will not take into consideration the hundreds, if not thousands, of point sources of pollution that will accumulate at the site, adjacent lands, and downslope beaches, caves and ocean. As clearly demonstrated by both US EPA and citizens in the State of Washington, drinking water wells as little within a few mile from a feedlot or dairy have been contaminated over time. In the state of California, land has been declared hazardous and unusable due to years of dairy farm operation.

As noted in the DOH and SurfRider water quality samples, pollution levels in the Waiopili stream already far exceed State and Federal water quality standards. The addition of 699-2000 cows and a large scale milking operation will only compound a situation that is already detrimental to human health and the environment.

The HDF EIS must address the following cumulative effects from its operation:

1: **Former uses and treatment of the land**. Describe any and all former uses of the site, including adjacent lands. Provide data on current conditions of soils, flora, fauna, air and water. This is necessary to set a baseline and to monitor future cumulative effects resulting from the proposed HDF operation. Note: This must include any and all alterations to the landscape started or completed by HDF prior

to the EIS, including the permits obtained or required. It must also include the mitigation efforts HDF will take to contain, decrease, and repair accumulated pollution levels already in existence on site. Also detail how will this work will be monitored and by whom.

2**. Present uses of the HDF site and adjacent lands** --agricultural, industrial and human related-- including the taro farm located at the bottom of the HDF site and the quarry located NW of the cave. This must include Human recreational uses such as pig hunting, hiking, and bathing. For example, HDF must explicitly outline provisions it will take to protect the taro farm from any incursions or adverse effects to the soils and food value of the crop.

3. **Future uses of the HDF site and adjacent land** should the dairy fail. Address the potential adverse effects from soil and groundwater contamination on the land that will or may limit future uses.

4. **Cumulative Weather conditions** and effects on the proposed operation. Historical data of rain fall, flooding, high winds and hurricanes must be examined in the context of reliable probabilities of flooding, runoff, destruction of buildings, paddocks and lagoons resulting in contamination of beaches below and South shores. Worst case scenarios must be described as well as impacts to human health and the environment.

5. **Cumulative Economic effects**: The EIS must address cumulative effects, over time, on property values, the tourist/hospitality industry and small businesses in the area. As noted in other locations where large dairies have operated, there will be a cumulative effect on public knowledge of odors, flies, and pollution. Perhaps initially the effect will be small but word of mouth, articles in magazines and trade journals will impact a vibrant industry that currently accounts for a large percentage of the island's financial resources. The ripple effect could eventually affect the entire island in terms of jobs, property values and taxes , and indeed all businesses who depend on tourists for their livelihood.

Thank you for your review and consideration of my concerns.

Julie M. Hagensen

2211 B Pane Rd

Koloa, Kauai HI 96756

Hawai'i Dairy Farms

MAHA'ULEPU, KAUA'I

ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE

An Environmental Impact Statement (EIS) is being prepared voluntarily by the Applicant to assess potential environmental impacts and mitigation measures associated with agricultural operations at Hawai'i Dairy Farms (HDF) at Māhā'ulepū, Kaua'i.

To assist in preparing the EIS, an Environmental Impact Statement Preparation Notice (EISPN) was recently published. A 30-day public comment period on the EISPN ends February 23, 2015. The purposes of the publication and comment period are two-fold:

1. to allow individuals and groups to request to become a consulted party; and
2. to provide written comment regarding effects of the proposed action.

NOTE: Submitted comments will be published in the Draft EIS

COMMENT

Name: Julie Hagensen Organization: _____

Preferred contact Method

Email: juliehagensen@comcast.net Postal Address: 2211-B Pane Rd. Koloa HI 96756

Phone: (Optional)

Comments: As a former regulator with over 10 years experience regulating Dairies in the State of Washington, I have grave concerns regarding the siting of an Industrial Dairy in Maha'ulepu.

During the EIS Phase HDF must analyze all possible sources of pollution and their potential effects on human health and the environment. This must be done at the 2000 head target and includes cumulative impacts over time.

Based on my experience and everything I have read concerning HDF's plan, I must conclude that this is the wrong location for an Industrial Dairy. Good science and common sense must prevail.

Return to:

Group 70 International, Inc.
925 Bethel Street, 5th Floor
Attn: HDF Project
Honolulu, HI 96813
hdf@group70int.com

And/or:

Hawaii State Department of Health
Environmental Planning Office
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Deadline: February 23, 2015

GROUP 70 INTERNATIONAL

May 26, 2016

Julie M. Hagensen
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Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Julie M. Hagensen:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

Your comments were received by the State of Hawai'i Department of Health Environmental Planning office. The Department of Health forwarded a copy of your comments to Group 70 International in order to be included in the Draft Environmental Impact Statement (EIS) analysis. This letter was prepared in response to your comments.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

DAIRY OPERATIONS: Hawai'i Dairy Farms (HDF) will establish and operate a sustainable, pastoral rotational-grazing dairy farm in Māhā'ulepū Valley on the island of Kaua'i to produce fresh, locally available nutritious milk for Hawai'i families. The rotational-grazing method utilizes 100 percent of the cows' manure as natural fertilizer to grow pasture grass as a primary source of nutrition for dairy cows. This cost-effective method will reduce reliance on imported fertilizer and feed. Pasture grass will comprise at least 70 percent of the animals' diet. As a part of

the Draft Environmental Impact Statement (EIS), the proposed facilities and operations for the dairy farm are described in Chapter 3.

The Environmental Impact Statement (EIS) Preparation Notice (EISPN), published January 23, 2015, described the proposed pasture-based rotational grazing system as a "zero-discharge, grass-fed dairy". The term "zero-discharge" under the U.S. Environmental Protection Agency related to concentrated feeding operations (CAFO) is a system designed to not discharge pollutants into waters of the United States. As noted previously, the HDF system is designed to utilize 100 percent of the cows' manure on-site. However, nutrients would be introduced to the HDF site with any use; the Draft EIS identifies the amount of nutrients anticipated from the proposed dairy operations that could pass through to ground and surface waters. Therefore, HDF elected to discontinue use of the term "zero discharge" as it was construed as no nutrients into the system.

The term "grass-fed" was used in the HDF EISPN. This term was used to identify HDF's intent to utilize a locally-produced feedstock – grass – for more than 70 percent of the dairy herds' diet. In January 2016, the U.S. Department of Agricultural (USDA) Marketing Survey created a narrow legal definition of "grass-fed". The USDA standard defines what animals can and cannot be fed. The Food Alliance, a project of several northwest colleges, believes that when consumers choose grass-fed products there is an expectation that these will come from animals raised on pasture on a forage-based diet. Due to the evolving definition of "grass-fed", the term in not used in this EIS.

The dairy facilities will occupy an area of approximately 10 acres on the western boundary of the site. The developed area "footprint" will be less than 2 percent of the total farm area. Four buildings will be constructed to serve different functions, supported by utilities and infrastructure. Additional building information can be found in Draft EIS Section 3.3.1.

Agricultural infrastructure and utilities required for the dairy operations will include storage tanks and silos, effluent storage ponds, livestock water systems, and drainage improvements. The irrigation system and distribution of livestock water are discussed in Draft EIS Section 3.5, Pasture Management.

The pastoral rotational-grazing dairy provides a local feedstock – grass – as the herd's primary food source. Reducing imported feed stabilizes costs and provides a food source closer to the natural diet of cows. Results of grass trials initially conducted at five sites across four Hawaiian Islands were instrumental in identifying appropriate varieties of grass, and suitable sites to support sufficient "dry matter" grass yields essential to a cow's diet. Additional project-specific trials at the Māhāʻulepū site on Kauai have been conducted for more than 18 months. The results have identified sufficient yield and nutrition to supply 70 percent of the cows' diet; improvements in grass productivity are anticipated to provide up to 85 percent of cows' diet.

The pasture-based model allows cows to move about freely, and to lie down and rest, which is part of the digestion cycle. The animals are managed in social groups

known as "mobs", mimicking the natural social order of bovines. Cows spend 22 hours of each 24-hour period foraging on pasture or resting, outdoors in natural light and fresh air. The gently sloped paddocks, walkways and races minimize the energy expended by the mature dairy cows as they graze or are transferred to and from the various paddocks and the mature dairy facility; surfaces of the walkways and cow races are designed to provide a comfortable path under hoof. The management practices and pasture model applied by HDF maximizes grass as the cows' primary nutrition source and minimizes stress to the animals. Cows tend to be healthier and live longer, productive lives with access to fresh air, high quality feed, and exercise while they forage.

The 470 acres of pasture will be divided into paddocks averaging 3 to 5 acres in size. Smaller paddocks located near the dairy facility will be used as temporary pasture for cows or calves being moved on or off the farm. To protect the water quality of surface water and downstream areas, paddock fences are set back 35 feet from the edge of drainage ways throughout the site. Existing vegetation within the setbacks will be managed or restored to reduce erosion, improve stability of ditch banks, increase net carbon storage, and improve and maintain water quality.

The majority of the pastures will be irrigated with non-potable water and/or diluted effluent through either the pivot irrigation systems or through gun irrigators. Irrigation water supply is provided to the farm from Waita Reservoir, and will be filtered and pumped to the various irrigation components on the farm. The irrigation system is controlled using computer software and GPS receivers to allow very precise application of irrigation and/or diluted effluent on the pasture. The pivots can rotate and apply irrigation water and/or diluted effluent at different rates depending on the actual irrigation needs of the farm.

NRCS provides technical guidance on applying agricultural waste depending on the desired use of the waste. Reflected in the title of the livestock waste guidance for Hawaiʻi is the parenthetical inclusion of the word "nutrients." Where waste is utilized as a resource, it is being used for the constituent components that provide benefit.

The NRCS Conservation Practice Standard 590, Nutrient Management, applies to commercial fertilizers, organic by-products, waste water, organic matter, and irrigation water. Nutrient management is the practice of managing the amount, rate, source, method of application, and timing of plant nutrients and soil amendments. The timing and application of nutrients will correspond with plant uptake, soil properties and weather conditions. For more information on nutrient balance management see Draft EIS Section 3.5.3, and Draft EIS Appendix D.

The effluent storage ponds are sized to accommodate 30 days of storage for up to 2,000 mature dairy cows, and over 85 days of storage for 699 mature dairy cows. It will be highly unlikely that the storage pond will be full at any time for the contemplated 2,000-cow dairy, and nearly impossible for the committed 699-cow dairy. Throughout the less than 30-day storage period, effluent is planned for application every four days, and the slurry application is expected at least once every 45 days, to ensure that the ponds are kept at manageable levels.

Cows lactate milk following the birth of calves. Newborn calves will be housed on the Māhāʻulepū site and provided essential colostrum and nutrients for a healthy start. During the calves' initial 90 days, they will be transitioned to pasture at HDF before transfer to ranches on Kauaʻi to be raised off-site. The committed herd size of 699 mature dairy cows at the Māhāʻulepū site applies to mature mature dairy cows. Animals in various stages of lactation and rest will be transferred between HDF and other partner ranches as needed for animal health and dairy productivity. This will benefit both the dairy and infuse the beef market in Hawaiʻi with a new, local source of pasture-raised calves. Male calves will become part of the beef cattle herd; heifers (young female calves that haven't given birth) will be raised until ready to return to the HDF herd as a birthing/mature dairy cow. For more information on off-site herd management, refer to Section 3.7 of the Draft EIS.

Health of the herd is of primary importance as the success of a dairy relies on cows effectively producing quality milk. All cows will be treated with a high standard of care. Dairy managers and caretakers will be trained and competent in handling animals to minimize stress and ensure the herds' welfare. A licensed veterinarian may prescribe use of antibiotics approved by the Food & Drug Administration (FDA) for treatment of illnesses. Adherence to guidelines that prohibit milk from cows undergoing antibiotic treatment will ensure no adulteration of milk. Routine laboratory tests of milk for traces of antibiotic residue will be conducted. HDF will not inject cows with bovine growth hormone, referred to as rBST or rBGH.

SOILS: Soil is an ecosystem that can be managed to provide nutrients for plant growth, to absorb and hold rainwater for use during dryer periods, to filter and buffer potential pollutants from leaving fields, to serve as a firm foundation for agricultural activities, and to provide habitat for soil microbes to flourish and diversify to keep the ecosystem healthy. Two rounds of independent soil sampling were undertaken at HDF to understand and characterize available soil nutrients and conditions. Section 4.3 of the Environmental Impact Statement (EIS) characterizes soil conditions, and anticipated impacts from effluent and supplemental nutrient application. Recommendations from Dr. Russell Yost and Nicholas Krueger of the University of Hawaiʻi at Mānoa are summarized. Their baseline nutrient report is included as Appendix C of the Draft EIS.

Soil conservation is a core principal behind establishment of the NRCS, which was formed out of the Soil Conservation Service to acknowledge its expanded role in watershed-scale approach using science-based tools and standards in agronomy, engineering economics, wildlife biology and other disciplines to aid landowners in implementation of conservation practices. NRCS conservation practices are listed in Chapter 3, Section 3.2; these practices codes identify design and construction standards related to drainage, materials, operations and applicable engineering standards. HDF will follow the developed Conservation Plan, which was approved by the West Kauaʻi Soil & Water Conservation District in December, 2013.

The United States Department of Agriculture (USDA) Natural Resources Conservation Services (NRCS) has mapped and classified soils for more than 95 percent of the United States. Comments received during the initial scoping for this EIS included a "Custom Soils Resource Report for Island of Kauaʻi, Hawaiʻi." The

report was generated from the USDA NRCS website, which allows any internet user to define an area of interest, customize data results, and generate a Custom Soil Resource Report. The user can select or deselect parameters based upon which data the user would like to display. These user-generated reports are not evaluated by NRCS.

The NRCS soils classifications and descriptions provide a good information base, however, in-field soils testing is needed to identify existing soil nutrient levels and conditions. The most abundant soil types at the HDF site are Kalihi Clay at 32 percent, Kaʻena Clay Brown Variant at 29 percent, and Lualualei Clay at roughly 14 percent of the dairy site. Laboratory analysis of soil samples collected in 2014 identified levels of pH, phosphorus, nitrogen, potassium, calcium, magnesium, organic matter, salinity, micronutrients and other constituents. The results illustrate that the soils are depleted of nutrients, which is typical for lands formerly used for sugarcane. The soil nutrient status and fertility demands of the primary crop, Kikuyu grass, were used to identify the quantities of nutrients required for productive grass growth. The soils data provide a baseline to guide adaptive nutrient management throughout establishment and maturity of the dairy.

A second round of field sampling was conducted in 2015, and focused on evaluation of soils characterized as "poorly drained", and established a quantitative baseline of soil salinity and sodicity to provide for future monitoring of soil health with application of manure effluent. Laboratory analysis determined electrical conductivity and exchangeable sodium percentage, in addition to nutrient levels of nitrogen phosphorus calcium, magnesium, and potassium.

Poorly drained is not an indication of low or poor infiltration. Infiltration refers to the ability of water to enter the soil surface, whereas "drainage" refers to the movement of water within or from the soil profile. Poorly drained soils typically have low hydraulic conductivity, or a slow rate of groundwater movement through the soil. This slow movement can create anaerobic conditions, which typically result in higher rates of denitrification. This is the conversion of potentially nitrates and nitrites to gaseous forms, which reduces the potential for impacts on waterbodies. In this way, "poorly drained" soils may represent less risk of nitrate and nitrite leaching to associated waterbodies than "well drained" soils (Yost, 2016).

As a result of reduced movement of water through the soil profile, the mobility of nutrients such as potassium and phosphorus is also reduced. Soil types at the HDF site are known to adsorb and retain large amounts of phosphorus. Under the NRCS phosphorus leaching index for Hawaiʻi soils, HDF soils show low risk for leaching. With low risk, phosphorus can be applied at rates greater than crop requirements if manure or other organic materials are used to supply nutrients.

The dairy's focus on robust and healthy grass growth will build organic matter in soils through use of manure as a natural fertilizer. Soil can incorporate carbon from the atmosphere, which benefits soil health. According to recent studies in the Soil Science Society of America Journal, the conversion of formerly tilled cropland to grazed pasture can drive substantial accumulation of organic carbons in soil, with a potential to offset up to one-third of the annual increase in atmospheric carbon

dioxide. The potential soil organic matter and carbon dioxide sequestration benefits are likely greatest in highly degraded soils in warm subtropical climates, partly due to long pasture-growing seasons. Long-term soil impacts are anticipated to result in improvement to the physical, chemical, and biological condition of the soil.

NATURAL HAZARDS: The potential impacts of natural hazards are evaluated in the Draft Environmental Impact Statement (EIS), including flooding, tsunami, earthquakes, and hurricanes. Draft EIS Section 4.6 addresses natural hazards.

The Māhāʻulepū property is not known to experience flooding conditions. The area is located within Federal Emergency Management Agency (FEMA) Zone X, areas determined to be outside the 0.2% annual chance floodplain. The proposed location for Hawaiʻi Dairy Farms (HDF) lies between the 60 and 150 feet elevation, outside the tsunami evacuation zone. The Kauaʻi and Niʻihau region of the Hawaiian Islands has experienced tremors from earthquakes originating further south in the island chain, but no known seismic activity has originated among these northern islands.

Although they occur infrequently, Kauaʻi has received a greater amount of damage from hurricanes when compared to the other Hawaiian Islands. Land management personnel in the Māhāʻulepū region during and following the hurricanes that affected Kauaʻi in 1982 and 1992 observed defoliation of vegetation, and no flooding events in the period following passage of the storms.

Preparedness is the best protection for natural disasters. Structural design of dairy facilities will meet International Building Code (IBC) 2006 standards with local amendments. Provisions in design will address wind loading (including hurricane gusts), rain and flood loading, and earthquake loading. A geotechnical evaluation of the area recommended Seismic Site Class D under IBC standards be utilized for foundation design where the barns and agricultural infrastructure will be constructed.

There has been no rainfall event that would exceed the capacity of the effluent ponds since rainfall has been recorded in Māhāʻulepū Valley. The effluent pond capacity has been designed above the regulatory requirement to contain the 25-year, 24-hour rainfall event. An emergency containment berm with additional capacity for another 30 days is included in the design. This design exceeds regulatory requirements, with containment in excess of the major rainfall events recorded on Kauaʻi over the past three decades.

An emergency preparedness plan for protection of animals has been prepared for HDF internal use that addresses hurricane, fire, and potential flooding hazard scenarios. HDF is not in a tsunami inundation area, so this scenario is not planned for in the disaster plan. The disaster plan relies upon knowledge of cow behavior, and is based on extensive guidance for livestock protection from NRCS, the Florida State Agricultural Response Team (SART), Pennsylvania State College of Agricultural Sciences, and Cornell University Cooperative Extension. The plan includes safety procedures during any disaster, follow up actions, and emergency contacts for assistance before, during or following the event. Further information is provided in the Draft EIS Section 4.6.2.

ARCHAEOLOGICAL AND CULTURAL: The Hawaiʻi Dairy Farms (HDF) project is subject to a historic preservation review by the State Department of Land and Natural Resources, State Historic Preservation Division (SHPD) under HRS Chapter 6E and Chapter 13-284. An Archaeological Inventory Survey (AIS) and a Cultural Impact Assessment (CIA) were conducted by Scientific Consultant Services (SCS) for the proposed project. EIS Sections 4.7 and 4.8 provide an evaluation of archaeology and cultural resources, with technical studies in Appendix G and H.

A total of sixteen historic properties were identified through a pedestrian survey of the project area and an extended survey area of 100 meters of the northern boundary. Six historic-era sites occur in the project area and 10 sites occur in the extended survey area. Only one of the sites is believed to be associated with pre-Contact and/or early historic times. State Site 50-30-10-2250, the agricultural heiau, and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area. The remaining sites consist of historic-era bridges, ditches, culverts, retaining walls, and a flume system dating from the 20th century and are affiliated with sugarcane cultivation.

That a majority of the documented sites are related to the historic-era is not surprising, given the massive landscape modifications that occurred during intensive sugarcane cultivation on the valley floor. Even historic era cultural materials associated with the many Land Commission Awards in the project area were non-existent, as explored through survey and subsurface exploration.

The sixteen historic properties have been assessed for significance by the archaeological consultant and the dairy project is anticipated to have no impact on these sites. No further archaeological work is recommended for the sites. Two of the sixteen sites are considered significant under multiple criteria, but occur outside the project area on lands owned by a different landowner. Both sites will not be adversely affected by the proposed dairy project. No site is related to burials, and no bonex were found. Such sites have been reported along coastal areas in sand dunes.

The cultural assessment examined the potential effect of the project on cultural resources, practices or beliefs, its potential to isolate cultural resources, practices or beliefs from their setting, and the potential of the project to introduce elements which may alter the setting in which cultural practices take place. Information received from the community indicates the Māhāʻulepū Ahupuaʻa, has been and is currently used for traditional cultural purposes. However, the dairy project area has not been included in these activities. It is clear that the gathered plants, trails, State Site 50-30-10-2250, the agricultural heiau, and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area.

The project will be fully enclosed by perimeter fencing along the boundary of the leased premises, which will ensure that project activities and any related impacts are contained within the project area. Based on the research and comments received from the community, it is reasonable to conclude that, pursuant to Act 50, the exercise of native Hawaiian rights or any ethnic group related to numerous traditional cultural practices will not be impacted by establishment of the dairy.

NOISE: Existing noise conditions of the project site and the surrounding Māhāʻulepū valley area are evaluated in the Draft Environmental Impact Statement (EIS), along with anticipated short-term and long-term noise conditions associated with the dairy farm and planned mitigation actions. Draft EIS Section 4.12 addresses noise conditions.

Noise can be defined as unwanted sound, a sound that is considered loud or unpleasant, and/or sound that causes disturbance. Research related to noise and livestock focuses on noise levels and minimization of unexpected sounds that cause undue stress on cows. Noise stress results in loss of livestock productivity and thereby financial loss to farmers and ranchers. Little research exists on the sound levels from livestock.

Sound is measured in decibels (dB). The State of Hawaiʻi Department of Health (DOH) rules use the A-weighting sound network (dBA) in the HAR §11-46, Community Noise Control. Sound through the air is similar to ripples on a pond of water. In open space without reflection, ripples spread uniformly in all directions and decrease in amplitude further from the source. In free field conditions such as outdoors, amplitude drops by half as distance doubles (OSHA, 2016). When sound passes close to absorbing ground cover such as grassland and fields, the "soft ground" absorbs extra sound as it passes. The Hawaiʻi Dairy Farms (HDF) site in Māhāʻulepū Valley is approximately 2 miles from the resort area, and 1.5 miles from the closest residential areas (on land zoned for agriculture). Typical noise currently generated near the HDF site includes truck ingress/egress along private farm roads, agricultural equipment, and cattle and sheep.

Construction work at the project site will involve activities that may generate an increase in noise levels. However, such exposures will be a short-term condition, occurring during daylight hours. Construction vehicles and activities must comply with DOH Administrative Rules. DOH noise control regulation requires a permit for construction activities that emit noise in excess of 78 decibels or that cost a total of more than $250,000. Mitigation measures to minimize construction noise will include the use of mufflers to suppress loud equipment and limitations on the hours of heavy equipment operation.

The dairy farm will utilize milking equipment contained in the milking parlor, and will use field equipment such as tractors. Under HAR §11-46, agriculture is classified as Zoning District Class C, which specifies maximum permissible sound levels of 70 dBA in the daytime and 70 dBA at nighttime. Dairy operations will generate noise in keeping with agricultural zoning of the parcel. The primary noise receptors in the area would be farmers working nearby parcels. Noise from the dairy will not exceed the DOH threshold, and will not contribute to excessive noise in the region.

DEMOGRAPHIC AND ECONOMIC: The potential impacts of Hawai'i Dairy Farms (HDF) to the existing economy were evaluated in the Draft Environmental Impact Statement (EIS), including a fiscal impact assessment report completed in April, 2016 by Plasch Economics Pacific. Draft EIS Section 4.15 addresses demographic and economic factors, with the complete report in Appendix J.

The HDF project would create short-term benefits through jobs for local construction personnel and local material suppliers. Such jobs would include equipment operators, cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, supervisors, painters, etc. Based on State employment multipliers, indirect employment related to Dairy construction would be expected to average about 16 jobs on Kauaʻi, and 8 on Oʻahu. Construction employment would be expected to average about 12 jobs per year during the development period. Thus direct-plus-indirect employment association with construction would be expected to average approximately 36 jobs, of which 28 would be on Kaua'i.

The HDF project would contribute to diversification of Kauaʻi's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Hawaiʻi Island), approximately10 percent of Hawaiʻi's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and indirect full-time equivalent jobs on Kauaʻi, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on Oʻahu.

HDF is expected to generate a net income of approximately $68,000 to the County when the 699 cow herd is established. When the dairy has matured to full production for the 699 cow dairy, net income to the State is calculated at $160,000 annually. With the potential contemplated herd size of up to 2,000 mature dairy cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be produced. This would double local milk production currently supplied by operational dairies on the Island of Hawaiʻi.

Additional employment generated by a possible expansion to accommodate the contemplated 2,000 mature dairy cow herd is estimated at approximately 3 construction jobs plus 4 indirect jobs on Kauaʻi, and 2 indirect jobs on Oʻahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an additional 5 full-time farm jobs would be added, with approximately 15 additional indirect jobs on Kauaʻi and another 8 indirect jobs on Oʻahu.

The dairy is expected to generate a net additional contribution to the County of approximately $8,000 for improvements related to expansion for the contemplated herd size of up to 2,000 mature dairy cows ($76,000 total versus $68,000 for the committed herd size). The State will derive approximately $360,000 annually in revenues from the contemplated 2,000-mature dairy cow dairy.

Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhā'ulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhā'ulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Po'ipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhā'ulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawai'i Department of Health Milk

Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhā'ulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhā'ulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhā'ulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kaua'i community.

Regional Water Demand: The adjacent, developed Kōloa-Po'ipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kaua'i will increase county-wide by 17,300 residents by 2030. The South Kaua'i population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kaua'i region (the Kōloa - Po'ipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhā'ulepū Surface

Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhāʻulepū watershed.

The HDF site is located on the bottom-land of the upper Māhāʻulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Haʻupu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhāʻulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kauaʻi Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhāʻulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhāʻulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhāʻulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Poʻipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kauaʻi community.

AIR QUALITY: As a part of the Environmental Impact Statement (EIS), existing air quality conditions and project impacts were evaluated, including dust and odor. Potential odors and emission levels for air pollutants relevant to dairy operations were modeled, as currently there are no cows on site. EIS sections 4.19 and 4.25 provide an evaluation of air quality and odors, including a windrose depicting wind speed and direction in the area (see DEIS Section 4.1, Climate). The full air quality technical report can be found in Draft EIS Appendix I.

Clean Air Act

Under the *Clean Air Act of 1970* (CAA), amended November 1990, the U.S. Environmental Protection Agency (EPA) regulates both large and small sources of

air pollutants by establishing National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. The State of Hawaiʻi has established its own *State Ambient Air Quality Standards* (SAAQS) that are as strict or, in some cases more strict than the NAAQS. State standards prohibit any visible emissions of fugitive dust from construction activities at the property line.

Emissions relevant to livestock operation include particulate matter and fugitive dust. Greenhouse gases related to dairy cows include methane (CH_4) from enteric fermentation, and both methane and nitrous oxide (N_20) emissions from manure application. No State or Federal regulations for greenhouse gas emissions from farm operations or small businesses currently exist.

DUST

Dust will be generated as cows move along soft limestone walkways that connect the paddocks and lead to and from the milking parlor. Potential fugitive dust emission rates were estimated from published literature, where particulate matter (PM) is measurable from the "drylots" of confined dairy operations where animals walk over dirt and dried manure throughout the day.

Applying the emission rates from this available literature greatly overestimates potential emission resulting from HDF. Cows in the pastoral rotational-grazing system will be on pasture 22 hours each day and will spend two hours – in two separate milking cycles –moving to and from the barn for the 10- to 15-minute milking sessions.

Using atmospheric dispersion modeling system (AERMOD), the rates were scaled to the size of the non-pasture areas used by cows at HDF. Results were added to the background concentration of particulate matter (both PM_{10} and $PM_{2.5}$) measured on the island of Kauaʻi, and the total concentration was compared to the State ambient air quality standards. Only the contemplated herd size of up to 2,000 mature dairy cows was modeled, as at the lower threshold of 699 cows, the potential fugitive dust impact would be negligible. The estimated concentration for PM_{10} is 2.01 $\mu g/m^3$, well below the State standard of 150 $\mu g/m^3$. The estimated concentration for $PM_{2.5}$ is 0.23 $\mu g/m^3$, well below the Federal standard of 35 $\mu g/m^3$ (see Draft EIS Section 4.19 and Table 4-19.2).

ODOR

Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF, so air dispersion models were used to determine potential odor levels. Local weather data was used in conjunction with the AERMOD modeling system, and published rates for manure odors emissions for dairy heifers and effluent ponds were adapted to reflect the HDF facilities.

Odor emission sources identified for modeling at HDF were manure in the pasture fields, irrigation water containing diluted nutrients from effluent, the effluent storage ponds, and the dairy buildings. Odor rates from published research were

applied. Odor isopleths (a line used to map all points having the same numerical value) were created to display the model findings. Odor is described in "odor units" at the threshold of perception, which is defined by the point at which 50 percent of panelists, in laboratory conditions, cannot smell the odor but 50 percent of the panelists can detect the odor.

Modeling results were generated for worst case meteorological conditions (low wind velocity / mixing). Generally, tradewinds will disperse odors to less than detectable levels beyond the HDF site; in periods of no wind, odor may not be dispersed creating the "worst case" scenario. In these periods without normal tradewind flow, the odor plume would extend to the south of the HDF site. Sections 4.19.2 and 4.25.2 of the EIS include graphics of the potential odor isopleths.

Results for the committed herd size of 699 mature dairy cows show that odors may be detectable by 50 percent of the sensitive population once per 200 hours, or 44 hours per year, within an area that extends approximately 1,670-feet (within one-third of a mile) beyond the dairy farm boundary, and does not reach recreational or residential areas. Results for the contemplated expanded herd size of up to 2,000 mature dairy cows show odors would not extend beyond 2,780 feet outside the HDF boundary (just over half a mile), again not reaching recreational or residential areas, and again with detection limited to 50 percent of the sensitive population approximately 44 hours per year. The parameters used in the analysis were intentionally conservative, and the impacts shown assume an unlikely confluence of worst-case meteorological data, irrigation location, and grazing location. Actual offsite odor impacts are likely to be much lower and/or less frequent than shown; it is likely odor detection beyond the HDF boundaries will be less frequent.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

From: Barrie Morgan on behalf of HDF@group70int.com
Sent: Thursday, January 29, 2015 5:39 PM
To: 'vhager'
Cc: JUDY DALTON
Subject: Received comments to Hawaii Dairy Farms project

The email confirms receipt of your comments regarding the Hawaii Dairy Farms project. Questions and comments on environmental resources will help shape the content of the Draft Environmental Impact Statement. Substantive comments with responses will be published in the Draft EIS.

Thank you for participating in the environmental review process.

From: vhager [mailto:vhager@msn.com]
Sent: Wednesday, January 28, 2015 1:17 PM
To: HDF@group70int.com
Cc: JUDY DALTON
Subject: WHY DOESN'T THE GOV EMAIL ADDRESS ACCEPT EMAILS

This is the worst location at the beach, stream and seeping of dung and urine. This will destroy the area and WHO wants to come and stay next to 600 cows. This proposal turns my stomach. This Kauai is being broken down in every available space !!
Vivian Hager
Kapaa Resident

Sent from my Verizon Wireless 4G LTE Smartphone

From: McIntyre, Laura <Laura.McIntyre@doh.hawaii.gov>
Sent: Monday, February 09, 2015 8:08 AM
To: vhager
Cc: HDF
Subject: RE: COW DUNG

Follow Up Flag: Follow up
Flag Status: Flagged

Aloha,
Thank you for your comments. I have forwarded them to the project consultants for review and consideration.
Mahalo,
Laura

From: vhager [mailto:vhager@msn.com]
Sent: Monday, February 09, 2015 7:34 AM
To: EPO
Subject: COW DUNG

Remember how long the Kilauea Farm smelled and only a few cows pasture in the location. My friends currently in New Zealand are sending info on devastating results of farming cows in pristine areas.
Vivian Hager

Sent from my Verizon Wireless 4G LTE Smartphone

GROUP 70 INTERNATIONAL

May 26, 2016

Vivian Hager
vhager@msn.com

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Vivian Hager:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

DAIRY OPERATIONS: Hawai'i Dairy Farms (HDF) will establish and operate a sustainable, pastoral rotational-grazing dairy farm in Māhā'ulepū Valley on the island of Kaua'i to produce fresh, locally available nutritious milk for Hawai'i families. The rotational-grazing method utilizes 100 percent of the cows' manure as natural fertilizer to grow pasture grass as a primary source of nutrition for dairy cows. This cost-effective method will reduce reliance on imported fertilizer and feed. Pasture grass will comprise at least 70 percent of the animals' diet. As a part of the Draft Environmental Impact Statement (EIS), the proposed facilities and operations for the dairy farm are described in Chapter 3.

The Environmental Impact Statement (EIS) Preparation Notice (EISPN), published January 23, 2015, described the proposed pasture-based rotational grazing system as a "zero-discharge, grass-fed dairy". The term "zero-discharge" under the U.S. Environmental Protection Agency related to concentrated feeding operations

Group 70 International • 925 Bethel Street, 5th Floor • Honolulu, HI 96813-4307 • tel. 808.523.5866 • fax. 808.523.5874 • www.group70int.com

(CAFO) is a system designed to not discharge pollutants into waters of the United States. As noted previously, the HDF system is designed to utilize 100 percent of the cows' manure on-site. However, nutrients would be introduced to the HDF site with any use; the Draft EIS identifies the amount of nutrients anticipated from the proposed dairy operations that could pass through to ground and surface waters. Therefore, HDF elected to discontinue use of the term "zero discharge" as it was construed as no nutrients into the system.

The term "grass-fed" was used in the HDF EISPN. This term was used to identify HDF's intent to utilize a locally-produced feedstock – grass – for more than 70 percent of the dairy herds' diet. In January 2016, the U.S. Department of Agricultural (USDA) Marketing Survey created a narrow legal definition of "grass-fed". The USDA standard defines what animals can and cannot be fed. The Food Alliance, a project of several northwest colleges, believes that when consumers choose grass-fed products there is an expectation that these will come from animals raised on pasture on a forage-based diet. Due to the evolving definition of "grass-fed", the term in not used in this EIS.

The dairy facilities will occupy an area of approximately 10 acres on the western boundary of the site. The developed area "footprint" will be less than 2 percent of the total farm area. Four buildings will be constructed to serve different functions, supported by utilities and infrastructure. Additional building information can be found in Draft EIS Section 3.3.1.

Agricultural infrastructure and utilities required for the dairy operations will include storage tanks and silos, effluent storage ponds, livestock water systems, and drainage improvements. The irrigation system and distribution of livestock water are discussed in Draft EIS Section 3.5, Pasture Management.

The pastoral rotational-grazing dairy provides a local feedstock – grass – as the herd's primary food source. Reducing imported feed stabilizes costs and provides a food source closer to the natural diet of cows. Results of grass trials initially conducted at five sites across four Hawaiian Islands were instrumental in identifying appropriate varieties of grass, and suitable sites to support sufficient "dry matter" grass yields essential to a cow's diet. Additional project-specific trials at the Māhāʻulepū site on Kauai have been conducted for more than 18 months. The results have identified sufficient yield and nutrition to supply 70 percent of the cows' diet; improvements in grass productivity are anticipated to provide up to 85 percent of cows' diet.

The pasture-based model allows cows to move about freely, and to lie down and rest, which is part of the digestion cycle. The animals are managed in social groups known as "mobs", mimicking the natural social order of bovines. Cows spend 22 hours of each 24-hour period foraging on pasture or resting, outdoors in natural light and fresh air. The gently sloped paddocks, walkways and races minimize the energy expended by the mature dairy cows as they graze or are transferred to and from the various paddocks and the mature dairy facility; surfaces of the walkways and cow races are designed to provide a comfortable path under hoof. The management practices and pasture model applied by HDF maximizes grass as the

cows' primary nutrition source and minimizes stress to the animals. Cows tend to be healthier and live longer, productive lives with access to fresh air, high quality feed, and exercise while they forage.

The 470 acres of pasture will be divided into paddocks averaging 3 to 5 acres in size. Smaller paddocks located near the dairy facility will be used as temporary pasture for cows or calves being moved on or off the farm. To protect the water quality of surface water and downstream areas, paddock fences are set back 35 feet from the edge of drainage ways throughout the site. Existing vegetation within the setbacks will be managed or restored to reduce erosion, improve stability of ditch banks, increase net carbon storage, and improve and maintain water quality.

The majority of the pastures will be irrigated with non-potable water and/or diluted effluent through either the pivot irrigation systems or through gun irrigators. Irrigation water supply is provided to the farm from Waita Reservoir, and will be filtered and pumped to the various irrigation components on the farm. The irrigation system is controlled using computer software and GPS receivers to allow very precise application of irrigation and/or diluted effluent on the pasture. The pivots can rotate and apply irrigation water and/or diluted effluent at different rates depending on the actual irrigation needs of the farm.

NRCS provides technical guidance on applying agricultural waste depending on the desired use of the waste. Reflected in the title of the livestock waste guidance for Hawaiʻi is the parenthetical inclusion of the word "nutrients." Where waste is utilized as a resource, it is being used for the constituent components that provide benefit.

The NRCS Conservation Practice Standard 590, Nutrient Management, applies to commercial fertilizers, organic by-products, waste water, organic matter, and irrigation water. Nutrient management is the practice of managing the amount, rate, source, method of application, and timing of plant nutrients and soil amendments. The timing and application of nutrients will correspond with plant uptake, soil properties and weather conditions. For more information on nutrient balance management see Draft EIS Section 3.5.3, and Draft EIS Appendix D.

The effluent storage ponds are sized to accommodate 30 days of storage for up to 2,000 mature dairy cows, and over 85 days of storage for 699 mature dairy cows. It will be highly unlikely that the storage pond will be full at any time for the contemplated 2,000-cow dairy, and nearly impossible for the committed 699-cow dairy. Throughout the less than 30-day storage period, effluent is planned for application every four days, and the slurry application is expected at least once every 45 days, to ensure that the ponds are kept at manageable levels.

Cows lactate milk following the birth of calves. Newborn calves will be housed on the Māhāʻulepū site and provided essential colostrum and nutrients for a healthy start. During the calves' initial 90 days, they will be transitioned to pasture at HDF before transfer to ranches on Kauaʻi to be raised off-site. The committed herd size of 699 mature dairy cows at the Māhāʻulepū site applies to mature mature dairy cows. Animals in various stages of lactation and rest will be transferred between HDF and

other partner ranches as needed for animal health and dairy productivity. This will benefit both the dairy and infuse the beef market in Hawai'i with a new, local source of pasture-raised calves. Male calves will become part of the beef cattle herd; heifers (young female calves that haven't given birth) will be raised until ready to return to the HDF herd as a birthing/mature dairy cow. For more information on off-site herd management, refer to Section 3.7 of the Draft EIS.

Health of the herd is of primary importance as the success of a dairy relies on cows effectively producing quality milk. All cows will be treated with a high standard of care. Dairy managers and caretakers will be trained and competent in handling animals to minimize stress and ensure the herds' welfare. A licensed veterinarian may prescribe use of antibiotics approved by the Food & Drug Administration (FDA) for treatment of illnesses. Adherence to guidelines that prohibit milk from cows undergoing antibiotic treatment will ensure no adulteration of milk. Routine laboratory tests of milk for traces of antibiotic residue will be conducted. HDF will not inject cows with bovine growth hormone, referred to as rBST or rBGH.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhā'ulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhā'ulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Po'ipū region is on the order of 201 – 500 feet per day.

Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhā'ulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawai'i Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhā'ulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhā'ulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhā'ulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kaua'i community.

Regional Water Demand: The adjacent, developed Kōloa-Po'ipū region shows large and increasing demand for potable water for community and resort development.

The State Department of Economic Development and Tourism (DBEDT) projects the population of Kaua'i will increase county-wide by 17,300 residents by 2030. The South Kaua'i population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kaua'i region (the Kōloa - Po'ipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhā'ulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhā'ulepū watershed.

The HDF site is located on the bottom-land of the upper Māhā'ulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Ha'upu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhā'ulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kaua'i Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhā'ulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhā'ulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhā'ulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the

current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Poʻipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality

monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kauaʻi community.

AIR QUALITY: As a part of the Environmental Impact Statement (EIS), existing air quality conditions and project impacts were evaluated, including dust and odor. Potential odors and emission levels for air pollutants relevant to dairy operations were modeled, as currently there are no cows on site. EIS sections 4.19 and 4.25 provide an evaluation of air quality and odors, including a windrose depicting wind speed and direction in the area (see DEIS Section 4.1, Climate). The full air quality technical report can be found in Draft EIS Appendix I.

Clean Air Act

Under the *Clean Air Act of 1970* (CAA), amended November 1990, the U.S. Environmental Protection Agency (EPA) regulates both large and small sources of air pollutants by establishing National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. The State of Hawaiʻi has established its own *State Ambient Air Quality Standards* (SAAQS) that are as strict or, in some cases more strict than the NAAQS. State standards prohibit any visible emissions of fugitive dust from construction activities at the property line.

Emissions relevant to livestock operation include particulate matter and fugitive dust. Greenhouse gases related to dairy cows include methane (CH_4) from enteric fermentation, and both methane and nitrous oxide (N_20) emissions from manure application. No State or Federal regulations for greenhouse gas emissions from farm operations or small businesses currently exist.

DUST

Dust will be generated as cows move along soft limestone walkways that connect the paddocks and lead to and from the milking parlor. Potential fugitive dust emission rates were estimated from published literature, where particulate matter (PM) is measurable from the "drylots" of confined dairy operations where animals walk over dirt and dried manure throughout the day.

Applying the emission rates from this available literature greatly overestimates potential emission resulting from HDF. Cows in the pastoral rotational-grazing system will be on pasture 22 hours each day and will spend two hours – in two separate milking cycles –moving to and from the barn for the 10- to 15-minute milking sessions.

Using atmospheric dispersion modeling system (AERMOD), the rates were scaled to the size of the non-pasture areas used by cows at HDF. Results were added to the background concentration of particulate matter (both PM_{10} and $PM_{2.5}$) measured on the island of Kauaʻi, and the total concentration was compared to the State ambient

air quality standards. Only the contemplated herd size of up to 2,000 mature dairy cows was modeled, as at the lower threshold of 699 cows, the potential fugitive dust impact would be negligible. The estimated concentration for PM_{10} is 2.01 μg/m^3, well below the State standard of 150 μg/m^3. The estimated concentration for $PM_{2.5}$ is 0.23 μg/m^3, well below the Federal standard of 35 μg/m^3 (see Draft EIS Section 4.19 and Table 4-19.2).

ODOR

Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF, so air dispersion models were used to determine potential odor levels. Local weather data was used in conjunction with the AERMOD modeling system, and published rates for manure odors emissions for dairy heifers and effluent ponds were adapted to reflect the HDF facilities.

Odor emission sources identified for modeling at HDF were manure in the pasture fields, irrigation water containing diluted nutrients from effluent, the effluent storage ponds, and the dairy buildings. Odor rates from published research were applied. Odor isopleths (a line used to map all points having the same numerical value) were created to display the model findings. Odor is described in "odor units" at the threshold of perception, which is defined by the point at which 50 percent of panelists, in laboratory conditions, cannot smell the odor but 50 percent of the panelists can detect the odor.

Modeling results were generated for worst case meteorological conditions (low wind velocity / mixing). Generally, tradewinds will disperse odors to less than detectable levels beyond the HDF site; in periods of no wind, odor may not be dispersed creating the "worst case" scenario. In these periods without normal tradewind flow, the odor plume would extend to the south of the HDF site. Sections 4.19.2 and 4.25.2 of the EIS include graphics of the potential odor isopleths.

Results for the committed herd size of 699 mature dairy cows show that odors may be detectable by 50 percent of the sensitive population once per 200 hours, or 44 hours per year, within an area that extends approximately 1,670-feet (within one-third of a mile) beyond the dairy farm boundary, and does not reach recreational or residential areas. Results for the contemplated expanded herd size of up to 2,000 mature dairy cows show odors would not extend beyond 2,780 feet outside the HDF boundary (just over half a mile), again not reaching recreational or residential areas, and again with detection limited to 50 percent of the sensitive population approximately 44 hours per year. The parameters used in the analysis were intentionally conservative, and the impacts shown assume an unlikely confluence of worst-case meteorological data, irrigation location, and grazing location. Actual offsite odor impacts are likely to be much lower and/or less frequent than shown; it is likely odor detection beyond the HDF boundaries will be less frequent.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

February 16, 2015

RECEIVED

FEB 18 2015

GROUP 70 INTL

Group 70 International Inc.
925 Bethel St.
5th Floor
Honolulu, HI 6813

To Whom It May Concern:

As a long time resident of the Poipu area in South Kauai, I would like to express my vehement opposition to the proposed Maha'ulepu dairy farm, which is in the planning stages in South Kauai.
My family has reviewed all of the pertinent facts surrounding this project, which has not been well planned from the outset.
The very thought of invading a pristine residential environment, coupled with a premier resort complex, is ill advised at best. The many faceted negative ramifications of this proposed project are obvious to the most uninformed group of residents on Kauai.
At the top of the list is the destruction of the current traditional environment, nurtured by the Hawaiian community.
The negative impact on the water supply is certainly paramount in the lengthening list of problems that the local community is facing. This is closely followed by the odor, which will grossly affect the standard of living in nearby communities. These key factors are followed by the fly infestation, which will be evident and indefensible.
The health problems will be inflated immeasurably and should fall under the jurisdiction of the environmental authorities.
Initial tests on the water supply in the area are irrefutable, inasmuch as they prove beyond a reasonable doubt that the water supply in the future will be affected by the increasingly large herd of cattle.
With regard to the tax base on the Island of Kauai, it is predictable that real estate prices will decline, hence, lowering the real estate taxes collected by the County of Kauai should the project move forward.
Your appropriate negative action relating to his matter, will be most appreciated, not only by my family, but to the large group of voters on the island of Kauai.
In the interests of all concerned, if the project was moved to a more suitable location, it would resolve this issue immediately.

Respectfully submitted,

John & Terri Halliday
2355 Hoohu Road
Koloa, HI 96756

GROUP 70 INTERNATIONAL

May 26, 2016

John & Terri Halliday
2355 Hoohu Road
Koloa, HI 96756

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear John & Terri Halliday:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

ARCHAEOLOGICAL AND CULTURAL: The Hawai'i Dairy Farms (HDF) project is subject to a historic preservation review by the State Department of Land and Natural Resources, State Historic Preservation Division (SHPD) under HRS Chapter 6E and Chapter 13-284. An Archaeological Inventory Survey (AIS) and a Cultural Impact Assessment (CIA) were conducted by Scientific Consultant Services (SCS) for the proposed project. EIS Sections 4.7 and 4.8 provide an evaluation of archaeology and cultural resources, with technical studies in Appendix G and H.

A total of sixteen historic properties were identified through a pedestrian survey of the project area and an extended survey area of 100 meters of the northern boundary. Six historic-era sites occur in the project area and 10 sites occur in the extended survey area. Only one of the sites is believed to be associated with pre-Contact and/or early historic times. State Site 50-30-10-2250, the agricultural heiau,

and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area. The remaining sites consist of historic-era bridges, ditches, culverts, retaining walls, and a flume system dating from the 20th century and are affiliated with sugarcane cultivation.

That a majority of the documented sites are related to the historic-era is not surprising, given the massive landscape modifications that occurred during intensive sugarcane cultivation on the valley floor. Even historic era cultural materials associated with the many Land Commission Awards in the project area were non-existent, as explored through survey and subsurface exploration.

The sixteen historic properties have been assessed for significance by the archaeological consultant and the dairy project is anticipated to have no impact on these sites. No further archaeological work is recommended for the sites. Two of the sixteen sites are considered significant under multiple criteria, but occur outside the project area on lands owned by a different landowner. Both sites will not be adversely affected by the proposed dairy project. No site is related to burials, and no bonex were found. Such sites have been reported along coastal areas in sand dunes.

The cultural assessment examined the potential effect of the project on cultural resources, practices or beliefs, its potential to isolate cultural resources, practices or beliefs from their setting, and the potential of the project to introduce elements which may alter the setting in which cultural practices take place. Information received from the community indicates the Māhāʻulepū Ahupuaʻa, has been and is currently used for traditional cultural purposes. However, the dairy project area has not been included in these activities. It is clear that the gathered plants, trails, State Site 50-30-10-2250, the agricultural heiau, and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area.

The project will be fully enclosed by perimeter fencing along the boundary of the leased premises, which will ensure that project activities and any related impacts are contained within the project area. Based on the research and comments received from the community, it is reasonable to conclude that, pursuant to Act 50, the exercise of native Hawaiian rights or any ethnic group related to numerous traditional cultural practices will not be impacted by establishment of the dairy.

PESTS: A study of invertebrate species and pest insects was conducted by Steven Lee Montgomery, PhD, Consulting Biologist in January 2016. The study summarizes the presence or absence of native species or pest species associated with cattle manure in the general Māhāʻulepū area, as well as the parasites and predators that control those species. No federally or state listed endangered or threatened invertebrate species were noted in the survey of the site. A full report and list of species found on site is provided in EIS Section 4.11 and Appendix B.

Flies were identified on the HDF site using manure from neighboring livestock as bait for invertebrates. The two flies associated with livestock are the stable fly and the horn fly, the latter known for biting cattle. These flies and the greenbottle fly are often confused with the house fly. Flies known to exist on Kauaʻi but not seen at the HDF site include the house fly, the dog dung fly, and the chicken dung fly. These pests

are common in areas with high pet populations. It is possible these fly species could inadvertently be brought to the dairy and utilize manure as a food source. HDF will prevent and control fly population growth through diligent clean up and sanitation practices regarding any trash and food waste, as well as through efficient manure composting practices. A full list of site management measures is provided in EIS Section 4.11. The project location does not provide any habitat for *drosophila musaphilia*, the only Kauaʻi species of native Hawaiian fly listed as Endangered or Threatened. Native Drosophila habitat is located many miles away in the high elevation koa-ʻōhiʻa forests.

Fly populations at HDF will be minimized through a process known as Integrated Pest Management (IPM). Essentially, IPM disrupts reproduction with appropriate means at key points in the pest's life cycle. Used in Hawaiʻi for decades, a number of invertebrates and a bird (the cattle egret) were introduced between 1898 and 1950 to reduce livestock-related insects. IPM utilizes knowledge of the ancient food web among species.

An especially important insect to minimize fly breeding habitat in manure is the dung beetle, which buries manure and incorporates it into the soil. Populations of dung beetles found on Kauaʻi and those species already in Māhāʻulepū Valley, will increase with the increased manure food source, thus increasing and speeding breakdown of manure. Dung beetles are specialists in the very important natural process of breaking up and quickly recycling bovine manure pads. The behavioral diversity among dung beetle species will work together to bury dung pats in one to three days, a shorter amount of time than the 10-30 days flies eggs need to hatch.

In the Kōloa-Poʻipū region, pest fly populations are dependent upon food and breeding sources nearby such as dog, cat, and chicken feces. Beef cattle graze in the region on agricultural lands along Ala Kinoiki Road between Kōloa and Poʻipū, and it is likely the livestock-related flies identified at the HDF site occur in this region as well. Localized controls to reduce pest populations need to address breeding sites in and amongst the food and animals wastes within the area. These mitigation measures will make it difficult for flies to breed, and BMPs will be enforced to address any increase in population, therefore it is expected that the dairy farm will not significantly affect recreational and resort areas.

DEMOGRAPHIC AND ECONOMIC: The potential impacts of Hawai'i Dairy Farms (HDF) to the existing economy were evaluated in the Draft Environmental Impact Statement (EIS), including a fiscal impact assessment report completed in April, 2016 by Plasch Economics Pacific. Draft EIS Section 4.15 addresses demographic and economic factors, with the complete report in Appendix J.

The HDF project would create short-term benefits through jobs for local construction personnel and local material suppliers. Such jobs would include equipment operators, cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, supervisors, painters, etc. Based on State employment multipliers, indirect employment related to Dairy construction would be expected to average about 16 jobs on Kauaʻi, and 8 on Oʻahu. Construction

employment would be expected to average about 12 jobs per year during the development period. Thus direct-plus-indirect employment association with construction would be expected to average approximately 36 jobs, of which 28 would be on Kaua'i.

The HDF project would contribute to diversification of Kaua'i's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Hawai'i Island), approximately10 percent of Hawai'i's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and indirect full-time equivalent jobs on Kaua'i, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on O'ahu.

HDF is expected to generate a net income of approximately $68,000 to the County when the 699 cow herd is established. When the dairy has matured to full production for the 699 cow dairy, net income to the State is calculated at $160,000 annually. With the potential contemplated herd size of up to 2,000 mature dairy cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be produced. This would double local milk production currently supplied by operational dairies on the Island of Hawai'i.

Additional employment generated by a possible expansion to accommodate the contemplated 2,000 mature dairy cow herd is estimated at approximately 3 construction jobs plus 4 indirect jobs on Kaua'i, and 2 indirect jobs on O'ahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an additional 5 full-time farm jobs would be added, with approximately 15 additional indirect jobs on Kaua'i and another 8 indirect jobs on O'ahu.

The dairy is expected to generate a net additional contribution to the County of approximately $8,000 for improvements related to expansion for the contemplated herd size of up to 2,000 mature dairy cows ($76,000 total versus $68,000 for the committed herd size). The State will derive approximately $360,000 annually in revenues from the contemplated 2,000-mature dairy cow dairy.

Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E

and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhā'ulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhā'ulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Po'ipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhā'ulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawai'i Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhā'ulepū 14 well during the sugarcane

plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhāʻulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhāʻulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kauaʻi community.

Regional Water Demand: The adjacent, developed Kōloa-Poʻipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kauaʻi will increase county-wide by 17,300 residents by 2030. The South Kauaʻi population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kauaʻi region (the Kōloa - Poʻipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhāʻulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhāʻulepū watershed.

The HDF site is located on the bottom-land of the upper Māhāʻulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Haʻupu Ridge. These normally dry streams converge into man-made channels running

through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhāʻulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kauaʻi Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhāʻulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhāʻulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhāʻulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or

maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater

and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Poʻipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kauaʻi community.

AIR QUALITY: As a part of the Environmental Impact Statement (EIS), existing air quality conditions and project impacts were evaluated, including dust and odor. Potential odors and emission levels for air pollutants relevant to dairy operations were modeled, as currently there are no cows on site. EIS sections 4.19 and 4.25 provide an evaluation of air quality and odors, including a windrose depicting wind speed and direction in the area (see DEIS Section 4.1, Climate). The full air quality technical report can be found in Draft EIS Appendix I.

Clean Air Act

Under the *Clean Air Act of 1970* (CAA), amended November 1990, the U.S. Environmental Protection Agency (EPA) regulates both large and small sources of air pollutants by establishing National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. The State of Hawaiʻi has established its own *State Ambient Air Quality Standards* (SAAQS) that are as strict or, in some cases more strict than the

NAAQS. State standards prohibit any visible emissions of fugitive dust from construction activities at the property line.

Emissions relevant to livestock operation include particulate matter and fugitive dust. Greenhouse gases related to dairy cows include methane (CH_4) from enteric fermentation, and both methane and nitrous oxide (N_20) emissions from manure application. No State or Federal regulations for greenhouse gas emissions from farm operations or small businesses currently exist.

DUST

Dust will be generated as cows move along soft limestone walkways that connect the paddocks and lead to and from the milking parlor. Potential fugitive dust emission rates were estimated from published literature, where particulate matter (PM) is measurable from the "drylots" of confined dairy operations where animals walk over dirt and dried manure throughout the day.

Applying the emission rates from this available literature greatly overestimates potential emission resulting from HDF. Cows in the pastoral rotational-grazing system will be on pasture 22 hours each day and will spend two hours – in two separate milking cycles –moving to and from the barn for the 10- to 15-minute milking sessions.

Using atmospheric dispersion modeling system (AERMOD), the rates were scaled to the size of the non-pasture areas used by cows at HDF. Results were added to the background concentration of particulate matter (both PM_{10} and $PM_{2.5}$) measured on the island of Kaua'i, and the total concentration was compared to the State ambient air quality standards. Only the contemplated herd size of up to 2,000 mature dairy cows was modeled, as at the lower threshold of 699 cows, the potential fugitive dust impact would be negligible. The estimated concentration for PM_{10} is 2.01 $\mu g/m^3$, well below the State standard of 150 $\mu g/m^3$. The estimated concentration for $PM_{2.5}$ is 0.23 $\mu g/m^3$, well below the Federal standard of 35 $\mu g/m^3$ (see Draft EIS Section 4.19 and Table 4-19.2).

ODOR

Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF, so air dispersion models were used to determine potential odor levels. Local weather data was used in conjunction with the AERMOD modeling system, and published rates for manure odors emissions for dairy heifers and effluent ponds were adapted to reflect the HDF facilities.

Odor emission sources identified for modeling at HDF were manure in the pasture fields, irrigation water containing diluted nutrients from effluent, the effluent storage ponds, and the dairy buildings. Odor rates from published research were applied. Odor isopleths (a line used to map all points having the same numerical value) were created to display the model findings. Odor is described in "odor units" at the threshold of perception, which is defined by the point at which 50 percent of

panelists, in laboratory conditions, cannot smell the odor but 50 percent of the panelists can detect the odor.

Modeling results were generated for worst case meteorological conditions (low wind velocity / mixing). Generally, tradewinds will disperse odors to less than detectable levels beyond the HDF site; in periods of no wind, odor may not be dispersed creating the "worst case" scenario. In these periods without normal tradewind flow, the odor plume would extend to the south of the HDF site. Sections 4.19.2 and 4.25.2 of the EIS include graphics of the potential odor isopleths.

Results for the committed herd size of 699 mature dairy cows show that odors may be detectable by 50 percent of the sensitive population once per 200 hours, or 44 hours per year, within an area that extends approximately 1,670-feet (within one-third of a mile) beyond the dairy farm boundary, and does not reach recreational or residential areas. Results for the contemplated expanded herd size of up to 2,000 mature dairy cows show odors would not extend beyond 2,780 feet outside the HDF boundary (just over half a mile), again not reaching recreational or residential areas, and again with detection limited to 50 percent of the sensitive population approximately 44 hours per year. The parameters used in the analysis were intentionally conservative, and the impacts shown assume an unlikely confluence of worst-case meteorological data, irrigation location, and grazing location. Actual offsite odor impacts are likely to be much lower and/or less frequent than shown; it is likely odor detection beyond the HDF boundaries will be less frequent.

ALTERNATIVES: As a part of the DEIS, alternatives were evaluated that could attain the objectives of the action's purpose and need, and were compared with environmental benefits, costs, and risks of each reasonable alternative against those of the proposed dairy project. Further discussion of alternatives can be found in DEIS Section 6.

The DEIS evaluates alternatives that could attain the objectives of the action's purpose and need, and compares environmental benefits, costs, and risks of each reasonable alternative against those of the proposed action. Additionally, reasonable land use alternatives that emerged from public input during the project scoping phase are documented and briefly discussed. The alternatives that do not meet the project purpose are not advanced for analysis of environmental benefits, costs, and risks. The Environmental Impact Statement Rules, Hawai'i Administrative Rules Chapter 11-200 (HRS 11-200) requires a discussion of alternatives that could attain the objectives of the action, regardless of cost. There is no requirement for the alternatives analysis to consider every possible land use.

Four possible land uses that would not meet the project purpose are discussed. Rezoning the land for resort or residential development, or a potential conservation condemnation are two uses that were examined and eliminated from analysis. These options would not be reasonably viable given the existing private land tenure and existing zoning. Two additional alternatives were considered as reasonable land uses as they could be permitted within the existing State Land Use Agricultural District and County Agricultural Zoning District. These options include Agricultural Park with Processing Center, and development of an Agricultural Subdivision. The

alternatives were examined and eliminated from further analysis, however, as they would not fulfill the project purpose.

The analysis, therefore, focuses on alternatives that meet the project purpose. Rigorous exploration and evaluation of the environmental impacts of the alternatives, including those that might enhance environmental quality or avoid, reduce or minimize some or all of the adverse environmental effects, costs and risks. These alternatives include: (1) the development of a Conventional Feedlot Dairy (a non-pasture-based dairy) at the same location; (2) development of the Pasture-Based Dairy at an Alternative Location on Kaua'i; and (3) milk products processing by HDF. The alternative of "No Action" is also evaluated.

The alternatives analysis provides a comprehensive evaluation of the range of potential alternatives, including the two alternative development scenarios. Although the alternatives are potentially reasonable uses under existing zoning and neighboring uses, each fails to comprehensively fulfill the project requirements defined by the eight Project Objectives and the four established Evaluation Criteria (Chapter 2, Sections 2.3.3 and 2.3.4).

The essential differences as compared to the proposed action are highlighted in the following statements.

- Only one of the alternative actions (conventional feedlot alternative) would create a commercial scale dairy operation in Hawai'i, with the capability to produce 10 percent of the State's fresh milk demand thus reducing dependence on imported milk (Objective 1). This alternative, however, would not reduce reliance on costly imported fertilizer and feed (Objective 2); grow local, quality grass as a primary feedstock (Objective 3); and would not utilize 100 percent of manure on site as nutrients to grow forage for dairy cows (Criterion 4).
- None of the alternatives would secure a dairy location that meets the requirements for a pastoral, pasture-based grazing dairy: sufficient contiguous land area; available long-term land tenure; adequate potable water supply; suitable soil properties; gentle slope conditions; and accessibility (Criterion 1).
- One alternative (Agricultural Park) could potentially generate new long-term employment in the agricultural sector on Kaua'i in a wide range of positions including pasture agronomy/soils science, environmental resources management (Criterion 2).
- The Agricultural Park alternative could also develop sustainable food production utilizing Important Agricultural Lands, demonstrating the importance of long-term agricultural leases and capital investment for agricultural infrastructure, water systems and support facilities. (Criterion 3). However, after years of trying, it appears there was limited interest in such a venture.
- Finally, addressing the range of potential environmental impacts (natural, cultural, social and economic) (Objective 8) the two alternative development scenarios would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.

In contrast to the other options considered, the planned agricultural operation of Hawai'i Dairy Farms, was determined to be the most viable option and is the preferred alternative. Of all the alternatives considered, this is the only approach that achieves project objectives and meets each of the four Evaluation Criteria.

- Hawai'i Dairy Farms will create a commercial scale pasture-based dairy operation in Hawai'i, with the capability to provide more than 1,000,000 gallons of the fresh milk demand, reducing dependence on imported milk (Objective 1).
- The planned dairy location meets the requirements of minimum land area, soil properties, slope conditions, water supply, land tenure and availability, and accessibility (Criterion 1).
- The planned action will generate new long-term employment in the agricultural sector on Kaua'i, including pasture agronomy/soils science, veterinary and animal husbandry, environmental resources management, milk/milk processing, and dairy business management (Criterion 2).
- Sustainable food production utilizing Important Agricultural Lands (Criterion 3) will occur with the proposed action, demonstrating the importance of long term agricultural leases, and the ability to draw capital investment for agricultural infrastructure including water systems and support facilities (Criterion 3).
- Address the range of potential environmental impacts by utilizing 100 percent of manure as natural fertilizer to grow the majority of food for cows (Criterion 4). The alternatives evaluated would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.
- Creating an economically viable pasture rotational-grazing model maintains agriculture, retains open space, and provides buffer between highly utilized resort and residential development and sensitive natural or cultural resources (Objective 8).

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

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Comments to be considered in preparation of an Environmental Impact statement for:
Project Name: Hawai'i Dairy Farms
Island: Kaua'i
District: Poipu
TMK: (4) 2-9-003:001 (portion); 006 (portion)
(4) 2-9-001:001 (portion)

To whom it may concern:

Waters of the State and United States:

The scope of the EIS must include a thorough consideration of the Public Trust Doctrine as articulated by Article XI of the Constitution of the State of Hawaii. The Hawaii State Supreme Court has authored at least four major Decisions enforcing the Public Trust Doctrine and its constitutionally intended protection for the waters of the State: Waiahole I (1994), Waiahole II (2000), Na Wai 'Eha (2012), and Kaua'i Springs (2014). Each of these cases dealt with situations in which water on agricultural land was either being diverted or taken for use by an agricultural operation or bottling company. In all cases the Court found that such uses constituted a violation of the Public Trust Doctrine. There is no reference to this doctrine in HDF's EIS. Hawaii Dairy Farm's Waste Management Plan also fails to refer to or consider this doctrine. It needs to be addressed by both HDF's Plan and the EIS.

Hawaii Dairy Farms (HDF) plans to irrigate the pastures at the Maha'ulepu site with 2.93 million gallons of water daily (MGD) from the Waita Reservoir according to HDF Waste Management Plan (WMP), pages 31, 37 and 44. Per HDF, their lease with Grove Farm entitles them to 3 MGD (million gallons daily) as a term of their lease contract. It may not be uncommon to have an agricultural lease include the use of water that is available on the agricultural site. In this case, however, the water that is available from the Waita Reservoir, an off-site reservoir that happens to be on other Grove Farm property, is water that collects from the Huleia Stream diversion which now feeds the Waita since the cessation of cane cultivation in 1996. The volume of water HDF plans to consume with irrigation of its 517 acres of grazing pasture (2.93 MGD) is substantial. But for the 100% diversion of the Hulia Stream, the Puna District used to receive water from the Hulei Stream, previously a major water resource for the natural watershed of the Niamalu River, the Alekoko Fishponds and several native Hawaiian taro farms. The farmers of the Puna District (covering the area where the Hulei waters flowed prior to the construction of the 100% diverter in 1957) are currently involved with the Department of Land and Natural Resources (DLNR), Commission on Water Resource Management (CWRM) seeking restoration of the natural watershed and revision/take down of the Huleia Stream diversion. HDF's planned water consumption from the Waita (2.93 MGD) far exceeds the Kaua'i Springs 1000 (5 Gallon) containers of water per day that Kaua'i Springs planned to draw from the stream flow. Kaua'I Springs, Hawaii Supreme Court, SCWC-29440, 28-FEB-2014, pages 3-4. If the Public Trust Doctrine applied in Kaua'I Springs it should certainly be a compelling consideration with the planned use of 2.93 MGD. Not only is the intended daily volume of water an issue, but of equal concern is the proposed new use of the water, the liquification of massive amounts of waste (3 million gallons of wet manure and 200,000 gallons of urine monthly from the start-up herd of 699 and 8.5 million gallons of wet manure and at least 600,000 gallons of urine monthly if the herd reaches 2,000 as planned). Clearly, a thorough evaluation of HDF' proposed new use for the waters of the Waita is warranted as well as a detailed analysis of the impact to "instream" and "out of stream" or "nonstream" flow standards.

Grove Farm acquired the Koloa Sugar Plantation which, like most sugar plantations, relied on an extensive ditch system to irrigate its crop. The Hulei Stream diversion, (a lengthy concrete diverter, covered by a steel grate that was is designed to divert 100% of the instream flow of the Huleia Stream, located mauka of the Kaumuali'i Highway/Route 50) provided the great majority of the waters relied on by Grove Farm for cultivation of the Koloa Sugar Company's cane. When Koloa Sugar ceased operation in 1996, the extensive irrigation system was no longer in use. The 100% diversion of the Huleia Stream was never revised despite the substantial decrease in need once the Koloa Sugar Company ceased its operations. Thereafter the diverted waters continued flowing from the Huleia and flowed to the Waita Reservoir. The Waita has since become the largest reservoir in the State of Hawaii. There is little question that these waters are waters of the State coming from the South slope of the Kilohana crater in Kahili Mountain. The water runs from the 100% stream diversion into a concrete catchment and then flows through a tunnel in the Haupu Mountain range, ending in the Waita Reservoir. The EIS needs to include HDF's proposed new use and its probable impacts as well as an analysis and evaluation of the degree of impact from the proposed use on the existing downstream users, instream flow, instream habitats, and dependent wildlife species. Although generally accepted that water use is included in the leases for agricultural parcels, the daily quantity of water needed for the proposed HDF operation (2.93 million gallons per day from the Waita) plus the potable water to be drawn daily from the Maha'ulepu wells far exceeds the typical agricultural use on Kaua'i.

In Re 'Iao Ground Water Management Area High-Level Source Water Use Permit Applications and Petition to Amend Interim Instream Flow Standards of Waihe'e River and Waihu, 'Iao, Waikapu Streams Contested Case Hearing Hawaii Supreme Court, No. SCAP-30603 August 15, 2012, the Court concluded that the Water Commission (WRM) erred in balancing instream and noninstream uses, and therefore, the Interim Instream Flow Standards (IIFS) do not properly protect traditional and customary native Hawaiian rights, appurtenant water rights or the public trust. p. 3. Based on the cultural practices as well as the historic and archeologic sites of Maha'ulepu, there is an equal if not greater risk at Maha'ulepu. The EIS needs to consider, environmental concerns,
native Hawaiian practices, outdoor and recreational activities,and aesthetic and scenic values, as required by the water code. p. 12-13 Those considerations are equally important the analysis of "offstream public trust uses, such as the public water supply." p. 16. "…the water code and our
case law interpreting the code have affirmed the Commission's duty to establish IIFS that 'protect instream values to the extent practicable' and 'protect the public interest' ." In re
Water Use Permit Applications "Waiâhole II", 105 Hawaii 1, 11,

93 P.3d 643, 653 (2004); HRS § 174C-71(2)(A). Clearly this must be addressed and study in full by the EIS.

In Kaua'i Springs the Court concluded that the water Kauai Springs uses for its operations originates from an underground spring located several miles from the Property, 1,000 feet up Kahili Mountain.1 Kauai Springs apparently "purchases" or "licenses" its water from EAK Knudsen Trust (Knudsen Trust), the owner of the land where the spring is located. The water is transmitted to the Property by a private, gravity-fed system dating back to the 1890s, which is owned by Knudsen Trust and operated by Grove Farm Company (Grove Farm).2 Hawaii Supreme Court, SCWC-29440, 28-FEB-2014, pages 3-4.

fn1.) Contrary to the findings of the circuit court, the EAK Knudsen Trust does not "own the spring [or] the water." See, e.g., In re Water Use Permit Applications, 94 Hawaii 97, 129, 9 P.3d 409, 441 (2000) ("a public trust was imposed upon all the waters of the kingdom. That is, . . . not ownership in the corporeal sense . . . rather, . . . a retention of such authority to assure the continued existence and beneficial application of the resource for the common good."

fn2.) According to the State Public Utilities Commission (PUC), "[t]he Grove Farm water system originates at one of two tunnels located on the land owned by the [Knudsen Trust] at the foot of Mount Kahili . . . . The water line delivers water to Kahili Mountain Park and a number of domestic and agricultural users on various Knudsen Trust-owned and other parcels on its way to Koloa Town, where it supplies at least eleven residential lots on Wailaau Road."

In Kauai Springs, the State Department of Health offered "[t]here may be the potential for ground or surface water degradation/contamination," and therefore "recommend[ed] that approvals for this project be conditioned upon a review by the State Department of Health and the developer's acceptance of any resulting requirements related to water quality."6 The Water Commission further commented that "[g]round-water withdrawals from this project may affect streamflows, which may require an instream flow standard amendment." Finally, the Water Commission stated that although a water use permit was not required because the island of Kaua'i was not a designated ground-water management area, other permits from the Water Commission may be required if the source of Kauai Springs' water was modified:

> The Island of Kauai has not been designated as a ground-water management area; therefore a water use permit from the Commission is not required to use the existing source(s) or to change the type of water use. However, if the source needs to be modified in any way, a well modification permit from the Commission may be required. In addition, if a pump is to be installed to induce additional water flow, a pump installation permit from the Commission would be required. If the source is modified to induce additional water flow, and the modification results in impacts to surface waters, a petition to amend the interim instream flow standard for affected surface waters must be made and approved prior to use of the water.

Kaua'i Springs, Supreme Court, SCWC-29440, 28-FEB-2014, page 10.

fn6.) The State Department of Health (DOH) offered several "environmental health concerns" for the Planning Commission to consider, regarding: 1) sanitary facilities and disposal of wastewater; 2) the water bottling facility's compliance with applicable ventilating requirements; and3) air pollution control measures. The DOH concluded that "[d]ue to the general nature of the application submitted," it "reserve[d] the right to implement future environmental health restrictions when more detailed information is provided."

fn8.) A "public utility" is defined as "every person who may own, control, operate, or manage as owner, lessee, trustee, receiver, or otherwise, whether under a franchise, charter, license, articles of association, or otherwise, any plant or equipment, of any part thereof, directly or indirectly for public use . . . for the production, conveyance, transmission, delivery, or furnishing of . . . water[.]" HRS § 269-1 (Supp. 2012). Supreme Court, SCWC-29440, 28-FEB-2014, page 14

"because it involves the use of an important public trust resource - fresh water - for personal financial gain," Supreme Court, SCWC-29440, 28-FEB-2014, page 17. This is all relevant to the HDF proposed industrial dairy as HDF's impact is certain to be of much greater consequence to the Hulei Stream flow standards than Kaua'i Springs ever intended to be.

In fact, in Kaua'i Springs, the Office of Hawaiian Affairs (OHA) argued that the Commission "uphold its public trust responsibilities by denying Kauai Springs' permit applications without prejudice, until the applicant can show, and the appropriate agencies can concur, that Kauai Springs' proposed use is reasonable-beneficial and will not interfere with public trust purposes." Supreme Court, SCWC-29440, 28-FEB-2014, page 18. Shouldn't Maha'ulepu deserve the same if not greater protection for its rich sites, cave reserve, habitats, delicate ecosystem when a much greater environmental impact is threatened by the proposed industrial dairy than that posed by Kaua'i Springs.

fn49.) For example, the public trust doctrine requires an applicant to demonstrate the feasibility of alternative sources of water. The findings do not indicate whether Applicant complied with this requirement. "[P]ermit applicants must . . . demonstrate the absence . . . of alternative water sources. Such a requirement is intrinsic to the public trust[.]" Waiahole I, 94 Hawai'i at 161, 9 P.3d at 473; see also Kukui (Molokai), Inc., 116 Hawai'i at 496, 174 P.3d at 335 ("The [agency] cannot fairly balance competing interests in a scarce public trust resource if it renders its decision prior to evaluating the availability of alternative sources of water.

Supreme Court, SCWC-29440, 28-FEB-2014, page 105
The Court held: "f. To assist agencies in the application of the public trust doctrine, we distill from our prior cases the following principles: 25
a. The agency's duty and authority is to maintain the purity and flow of our waters for future generations and to assure that the waters of our land are put to reasonable and beneficial use.26
b. The agency must determine whether the proposed use is consistent with the trust purposes:

fn25.) We provide this framework for assistance and do not indicate that it is mandatory or that it precludes other analytical approaches that are consistent with the public trust doctrine.
fn26.) Waiahole I, 94 Hawai'i at 138, 9 P.3d at 450.

i. the maintenance of waters in their natural state;
ii. the protection of domestic water use;
iii. the protection of water in the exercise of Native Hawaiian and traditional and customary rights; and
iv. the reservation of water enumerated by the State Water Code.

c. The agency is to apply a presumption in favor of public use, access, enjoyment, and resource protection.27

d. The agency should evaluate each proposal for use on a case-by-case basis, recognizing that there can be no vested rights in the use of public water.28

e. If the requested use is private or commercial, the agency should apply a high level of scrutiny.29

f. The agency should evaluate the proposed use under a "reasonable and beneficial use" standard, which requires examination of the proposed use in relation to other public and private uses.30
Applicants have the burden to justify the proposed water use in light of the trust purposes.31
fn27.) Id. at 142, 154 n.59, 9 P.3d at 454, 466 n.59.
fn28.) Id. at 141, 9 P.3d at 453; Kukui (Molokai), Inc., 116 Hawai#i at 490, 174 P.3d at 329.
fn29.)29 Wai–hole I, 94 Hawai#i at 142, 9 P.3d at 454.
fn30.) Id. at 161, 9 P.3d at 473.
fn31.) Kukui (Molokai), Inc., 116 Hawai#i at 490, 174 P.3d at 329.

a. Permit applicants must demonstrate their actual needs and the propriety of draining water from public streams to satisfy those needs.32

b. The applicant must demonstrate the absence of a practicable alternative water source.33

c. If there is a reasonable allegation of harm to public trust purposes, then the applicant must demonstrate that there is no harm in fact or that the requested use is nevertheless reasonable and beneficial.34

d. If the impact is found to be reasonable and beneficial, the applicant must implement reasonable measures to mitigate the cumulative impact of existing and proposed diversions on trust purposes, if the proposed use is to be approved.[35]

fn32.) Wai~hole I, 94 Hawai'i at 162, 9 P.3d at 474.
fn33.) Id. at 161, 9 P.3d at 473.
fn34.) Kukui (Molokai), Inc., 116 Hawai'i at 499, 174 P.3d at 338.
fn35.) Wai~hole I, at 143, 161, 9 P.3d at 455, 473.
fn36.) The ICA held that the circuit court's COLs ¶ 63 (record was "devoid of any evidence that Kauai Springs['] existing or proposed uses might affect water resources subject to the public trust"), ¶ 71 and ¶ 72 (suggesting that Planning Commission "may" have public trust duties in this case) were "incorrect in that they do not recognize the Planning Commission's public trust duty to consider and review Kauai Springs' water usage in its water bottling operation." Kauai Springs, 130 Hawai'i at 423, 312 P.3d at 299. In its Application, Kauai Springs does not challenge the ICA's conclusion that the Planning Commission had a duty to consider Kauai Springs' water usage in reviewing its permit application. Rather, Kauai Springs argues that the ICA erred in vacating the circuit court's COLs because the circuit court recognized the Planning Commission's public trust duties and correctly found that the Planning Commission fulfilled these duties.

Supreme Court, SCWC-29440, 28-FEB-2014, pages 85-88

Alternatives:

In the EISPN, the discussion of alternatives, offering only one other location to be considered, fails to satisfy a real alternative evaluation for an operation that is well known for its significant adverse environmental impacts. Clearly, the EIS should explore at least three other locations at a minimum.

In its discussion of a Confined Dairy Operation Alternative, HDF proposes a "Confined Dairy Operation". Assuming the public trust water rights are adequately protected and preserved, if HDF chooses to proceed with a true CAFO, the EISPN offers only that "the Mähä'ulepü location would require additional manure management as nutrients would not be returned to pastures. Additional grain and forages would be imported to sustain dairy cows. The Confined Dairy Operation Alternative would utilize large barns to house and feed the cows. Animals would be confined within the barns and milking parlor; no pasture area would be required. No manure would be deposited on pasture grasses and grass would not be utilized as a locally available feed source." The EIS must address why feed cannot be cultivated on the property, why a methane digester cannot be implemented saving electricity consumption from the Grid that would also help to collect manure, lowering the odor, fly and other pest problems to potentially feasible levels. To address alternatives, the scope of the EIS must be expanded to include these and other related considerations.

Important Agricultural Land (IAL), Hawaii State Constitution, Article XI, Section 3.

The EIS must consider HDF's website boast that it intends to be "the first commercial use of IAL land". Is that what the State intended when the provisions of the IAL enactments were adopted? Is IAL land even appropriate for a commercial agricultural operation? This must be addressed by the.

HDF's claim that their proposed industrial dairy will lead to agricultural self-sufficiency must be substantiated in the EIS, especially when the WMP calls for shipping the milk off island, selling the milk wholesale to another company who would then process, bottle and distribute for sale at locations they select.

Sugar cane cultivation has left the proposed farm soils "depleted of essential nutrients" pg 56 HDF WMP, Section 8.1. The EIS needs to substantiate the scientific support for their claim that the proposed dairy would in any way improve the soil at Maha'ulepu. Hooves from 1200 pound cows are in themselves degrading to soil, contributing to erosion and nutrient loss. The addition of nutrients does not remediate soil and the EIS needs to address the claimed benefit of an industrial dairy to the soil composition at Maha'ulepu.

Table 5 - Potential Impact Categories for Liner Failure
1. Any underlying aquifer is at a shallow depth and not confined
2. The vadose zone is rock
3. The aquifer is a domestic water supply or ecologically vital water supply
4. The site is located in an area of solutionized bedrock such as limestone or gypsum.

Considerations for Minimizing the Potential of Waste Storage Pond Liner Failure.
Sites with categories listed in Table 5 should be avoided unless no reasonable alternative. 313 p 6 of 7
NRCS, PI
April 2012

Table 4 - Potential Impact Categories from Breach of Embankment or Accidental Release
1. Surface water bodies -- perennial streams, lakes, wetlands, and estuaries
2. Critical habitat for threatened and endangered species.
3. Riparian areas
4. Farmstead, or other areas of habitation
5. Off-farm property
6. Historical and/or archaeological sites or structures that meet the eligibility criteria for listing in the National Register of Historical Places.

Cultural Practices, Historical and Archeological Sites are all at risk. The foregoing considerations are from the NRCS manual stapled to the back of the WMP but were not specifically incorporated in or addressed by the WMP. The EIS needs to address these aspects of the NRCS and others as well to cover this risk which from our present evaluation, especially based on the findings of the Custom Soil Resource Report of the NRCS, dated June 5, 2014.

Respectfully,

Robert and Bridget Hammerquist

Bridget Hammerquist
Robert E Hammerquist

May 26, 2016

Bridget Hammerquist
bridgethammerquist@hawaiiantel.net

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Bridget Hammerquist:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

DAIRY OPERATIONS: Hawai'i Dairy Farms (HDF) will establish and operate a sustainable, pastoral rotational-grazing dairy farm in Māhā'ulepū Valley on the island of Kaua'i to produce fresh, locally available nutritious milk for Hawai'i families. The rotational-grazing method utilizes 100 percent of the cows' manure as natural fertilizer to grow pasture grass as a primary source of nutrition for dairy cows. This cost-effective method will reduce reliance on imported fertilizer and feed. Pasture grass will comprise at least 70 percent of the animals' diet. As a part of the Draft Environmental Impact Statement (EIS), the proposed facilities and operations for the dairy farm are described in Chapter 3.

The Environmental Impact Statement (EIS) Preparation Notice (EISPN), published January 23, 2015, described the proposed pasture-based rotational grazing system as a "zero-discharge, grass-fed dairy". The term "zero-discharge" under the U.S. Environmental Protection Agency related to concentrated feeding operations

(CAFO) is a system designed to not discharge pollutants into waters of the United States. As noted previously, the HDF system is designed to utilize 100 percent of the cows' manure on-site. However, nutrients would be introduced to the HDF site with any use; the Draft EIS identifies the amount of nutrients anticipated from the proposed dairy operations that could pass through to ground and surface waters. Therefore, HDF elected to discontinue use of the term "zero discharge" as it was construed as no nutrients into the system.

The term "grass-fed" was used in the HDF EISPN. This term was used to identify HDF's intent to utilize a locally-produced feedstock – grass – for more than 70 percent of the dairy herds' diet. In January 2016, the U.S. Department of Agricultural (USDA) Marketing Survey created a narrow legal definition of "grass-fed". The USDA standard defines what animals can and cannot be fed. The Food Alliance, a project of several northwest colleges, believes that when consumers choose grass-fed products there is an expectation that these will come from animals raised on pasture on a forage-based diet. Due to the evolving definition of "grass-fed", the term in not used in this EIS.

The dairy facilities will occupy an area of approximately 10 acres on the western boundary of the site. The developed area "footprint" will be less than 2 percent of the total farm area. Four buildings will be constructed to serve different functions, supported by utilities and infrastructure. Additional building information can be found in Draft EIS Section 3.3.1.

Agricultural infrastructure and utilities required for the dairy operations will include storage tanks and silos, effluent storage ponds, livestock water systems, and drainage improvements. The irrigation system and distribution of livestock water are discussed in Draft EIS Section 3.5, Pasture Management.

The pastoral rotational-grazing dairy provides a local feedstock – grass – as the herd's primary food source. Reducing imported feed stabilizes costs and provides a food source closer to the natural diet of cows. Results of grass trials initially conducted at five sites across four Hawaiian Islands were instrumental in identifying appropriate varieties of grass, and suitable sites to support sufficient "dry matter" grass yields essential to a cow's diet. Additional project-specific trials at the Māhā'ulepū site on Kauai have been conducted for more than 18 months. The results have identified sufficient yield and nutrition to supply 70 percent of the cows' diet; improvements in grass productivity are anticipated to provide up to 85 percent of cows' diet.

The pasture-based model allows cows to move about freely, and to lie down and rest, which is part of the digestion cycle. The animals are managed in social groups known as "mobs", mimicking the natural social order of bovines. Cows spend 22 hours of each 24-hour period foraging on pasture or resting, outdoors in natural light and fresh air. The gently sloped paddocks, walkways and races minimize the energy expended by the mature dairy cows as they graze or are transferred to and from the various paddocks and the mature dairy facility; surfaces of the walkways and cow races are designed to provide a comfortable path under hoof. The management practices and pasture model applied by HDF maximizes grass as the

cows' primary nutrition source and minimizes stress to the animals. Cows tend to be healthier and live longer, productive lives with access to fresh air, high quality feed, and exercise while they forage.

The 470 acres of pasture will be divided into paddocks averaging 3 to 5 acres in size. Smaller paddocks located near the dairy facility will be used as temporary pasture for cows or calves being moved on or off the farm. To protect the water quality of surface water and downstream areas, paddock fences are set back 35 feet from the edge of drainage ways throughout the site. Existing vegetation within the setbacks will be managed or restored to reduce erosion, improve stability of ditch banks, increase net carbon storage, and improve and maintain water quality.

The majority of the pastures will be irrigated with non-potable water and/or diluted effluent through either the pivot irrigation systems or through gun irrigators. Irrigation water supply is provided to the farm from Waita Reservoir, and will be filtered and pumped to the various irrigation components on the farm. The irrigation system is controlled using computer software and GPS receivers to allow very precise application of irrigation and/or diluted effluent on the pasture. The pivots can rotate and apply irrigation water and/or diluted effluent at different rates depending on the actual irrigation needs of the farm.

NRCS provides technical guidance on applying agricultural waste depending on the desired use of the waste. Reflected in the title of the livestock waste guidance for Hawai'i is the parenthetical inclusion of the word "nutrients." Where waste is utilized as a resource, it is being used for the constituent components that provide benefit.

The NRCS Conservation Practice Standard 590, Nutrient Management, applies to commercial fertilizers, organic by-products, waste water, organic matter, and irrigation water. Nutrient management is the practice of managing the amount, rate, source, method of application, and timing of plant nutrients and soil amendments. The timing and application of nutrients will correspond with plant uptake, soil properties and weather conditions. For more information on nutrient balance management see Draft EIS Section 3.5.3, and Draft EIS Appendix D.

The effluent storage ponds are sized to accommodate 30 days of storage for up to 2,000 mature dairy cows, and over 85 days of storage for 699 mature dairy cows. It will be highly unlikely that the storage pond will be full at any time for the contemplated 2,000-cow dairy, and nearly impossible for the committed 699-cow dairy. Throughout the less than 30-day storage period, effluent is planned for application every four days, and the slurry application is expected at least once every 45 days, to ensure that the ponds are kept at manageable levels.

Cows lactate milk following the birth of calves. Newborn calves will be housed on the Māhā'ulepū site and provided essential colostrum and nutrients for a healthy start. During the calves' initial 90 days, they will be transitioned to pasture at HDF before transfer to ranches on Kaua'i to be raised off-site. The committed herd size of 699 mature dairy cows at the Māhā'ulepū site applies to mature mature dairy cows. Animals in various stages of lactation and rest will be transferred between HDF and

other partner ranches as needed for animal health and dairy productivity. This will benefit both the dairy and infuse the beef market in Hawai'i with a new, local source of pasture-raised calves. Male calves will become part of the beef cattle herd; heifers (young female calves that haven't given birth) will be raised until ready to return to the HDF herd as a birthing/mature dairy cow. For more information on off-site herd management, refer to Section 3.7 of the Draft EIS.

Health of the herd is of primary importance as the success of a dairy relies on cows effectively producing quality milk. All cows will be treated with a high standard of care. Dairy managers and caretakers will be trained and competent in handling animals to minimize stress and ensure the herds' welfare. A licensed veterinarian may prescribe use of antibiotics approved by the Food & Drug Administration (FDA) for treatment of illnesses. Adherence to guidelines that prohibit milk from cows undergoing antibiotic treatment will ensure no adulteration of milk. Routine laboratory tests of milk for traces of antibiotic residue will be conducted. HDF will not inject cows with bovine growth hormone, referred to as rBST or rBGH.

SOILS: Soil is an ecosystem that can be managed to provide nutrients for plant growth, to absorb and hold rainwater for use during dryer periods, to filter and buffer potential pollutants from leaving fields, to serve as a firm foundation for agricultural activities, and to provide habitat for soil microbes to flourish and diversify to keep the ecosystem healthy. Two rounds of independent soil sampling were undertaken at HDF to understand and characterize available soil nutrients and conditions. Section 4.3 of the Environmental Impact Statement (EIS) characterizes soil conditions, and anticipated impacts from effluent and supplemental nutrient application. Recommendations from Dr. Russell Yost and Nicholas Krueger of the University of Hawai'i at Mānoa are summarized. Their baseline nutrient report is included as Appendix C of the Draft EIS.

Soil conservation is a core principal behind establishment of the NRCS, which was formed out of the Soil Conservation Service to acknowledge its expanded role in watershed-scale approach using science-based tools and standards in agronomy, engineering economics, wildlife biology and other disciplines to aid landowners in implementation of conservation practices. NRCS conservation practices are listed in Chapter 3, Section 3.2; these practices codes identify design and construction standards related to drainage, materials, operations and applicable engineering standards. HDF will follow the developed Conservation Plan, which was approved by the West Kaua'i Soil & Water Conservation District in December, 2013.

The United States Department of Agriculture (USDA) Natural Resources Conservation Services (NRCS) has mapped and classified soils for more than 95 percent of the United States. Comments received during the initial scoping for this EIS included a "Custom Soils Resource Report for Island of Kaua'i, Hawai'i." The report was generated from the USDA NRCS website, which allows any internet user to define an area of interest, customize data results, and generate a Custom Soil Resource Report. The user can select or deselect parameters based upon which data the user would like to display. These user-generated reports are not evaluated by NRCS.

The NRCS soils classifications and descriptions provide a good information base, however, in-field soils testing is needed to identify existing soil nutrient levels and conditions. The most abundant soil types at the HDF site are Kalihi Clay at 32 percent, Ka'ena Clay Brown Variant at 29 percent, and Lualualei Clay at roughly 14 percent of the dairy site. Laboratory analysis of soil samples collected in 2014 identified levels of pH, phosphorus, nitrogen, potassium, calcium, magnesium, organic matter, salinity, micronutrients and other constituents. The results illustrate that the soils are depleted of nutrients, which is typical for lands formerly used for sugarcane. The soil nutrient status and fertility demands of the primary crop, Kikuyu grass, were used to identify the quantities of nutrients required for productive grass growth. The soils data provide a baseline to guide adaptive nutrient management throughout establishment and maturity of the dairy.

A second round of field sampling was conducted in 2015, and focused on evaluation of soils characterized as "poorly drained", and established a quantitative baseline of soil salinity and sodicity to provide for future monitoring of soil health with application of manure effluent. Laboratory analysis determined electrical conductivity and exchangeable sodium percentage, in addition to nutrient levels of nitrogen phosphorus calcium, magnesium, and potassium.

Poorly drained is not an indication of low or poor infiltration. Infiltration refers to the ability of water to enter the soil surface, whereas "drainage" refers to the movement of water within or from the soil profile. Poorly drained soils typically have low hydraulic conductivity, or a slow rate of groundwater movement through the soil. This slow movement can create anaerobic conditions, which typically result in higher rates of denitrification. This is the conversion of potentially nitrates and nitrites to gaseous forms, which reduces the potential for impacts on waterbodies. In this way, "poorly drained" soils may represent less risk of nitrate and nitrite leaching to associated waterbodies than "well drained" soils (Yost, 2016).

As a result of reduced movement of water through the soil profile, the mobility of nutrients such as potassium and phosphorus is also reduced. Soil types at the HDF site are known to adsorb and retain large amounts of phosphorus. Under the NRCS phosphorus leaching index for Hawai'i soils, HDF soils show low risk for leaching. With low risk, phosphorus can be applied at rates greater than crop requirements if manure or other organic materials are used to supply nutrients.

The dairy's focus on robust and healthy grass growth will build organic matter in soils through use of manure as a natural fertilizer. Soil can incorporate carbon from the atmosphere, which benefits soil health. According to recent studies in the Soil Science Society of America Journal, the conversion of formerly tilled cropland to grazed pasture can drive substantial accumulation of organic carbons in soil, with a potential to offset up to one-third of the annual increase in atmospheric carbon dioxide. The potential soil organic matter and carbon dioxide sequestration benefits are likely greatest in highly degraded soils in warm subtropical climates, partly due to long pasture-growing seasons. Long-term soil impacts are anticipated to result in improvement to the physical, chemical, and biological condition of the soil.

ARCHAEOLOGICAL AND CULTURAL: The Hawai'i Dairy Farms (HDF) project is subject to a historic preservation review by the State Department of Land and Natural Resources, State Historic Preservation Division (SHPD) under HRS Chapter 6E and Chapter 13-284. An Archaeological Inventory Survey (AIS) and a Cultural Impact Assessment (CIA) were conducted by Scientific Consultant Services (SCS) for the proposed project. EIS Sections 4.7 and 4.8 provide an evaluation of archaeology and cultural resources, with technical studies in Appendix G and H.

A total of sixteen historic properties were identified through a pedestrian survey of the project area and an extended survey area of 100 meters of the northern boundary. Six historic-era sites occur in the project area and 10 sites occur in the extended survey area. Only one of the sites is believed to be associated with pre-Contact and/or early historic times. State Site 50-30-10-2250, the agricultural heiau, and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area. The remaining sites consist of historic-era bridges, ditches, culverts, retaining walls, and a flume system dating from the 20th century and are affiliated with sugarcane cultivation.

That a majority of the documented sites are related to the historic-era is not surprising, given the massive landscape modifications that occurred during intensive sugarcane cultivation on the valley floor. Even historic era cultural materials associated with the many Land Commission Awards in the project area were non-existent, as explored through survey and subsurface exploration.

The sixteen historic properties have been assessed for significance by the archaeological consultant and the dairy project is anticipated to have no impact on these sites. No further archaeological work is recommended for the sites. Two of the sixteen sites are considered significant under multiple criteria, but occur outside the project area on lands owned by a different landowner. Both sites will not be adversely affected by the proposed dairy project. No site is related to burials, and no bonex were found. Such sites have been reported along coastal areas in sand dunes.

The cultural assessment examined the potential effect of the project on cultural resources, practices or beliefs, its potential to isolate cultural resources, practices or beliefs from their setting, and the potential of the project to introduce elements which may alter the setting in which cultural practices take place. Information received from the community indicates the Māhā'ulepū Ahupua'a, has been and is currently used for traditional cultural purposes. However, the dairy project area has not been included in these activities. It is clear that the gathered plants, trails, State Site 50-30-10-2250, the agricultural heiau, and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area.

The project will be fully enclosed by perimeter fencing along the boundary of the leased premises, which will ensure that project activities and any related impacts are contained within the project area. Based on the research and comments received from the community, it is reasonable to conclude that, pursuant to Act 50, the exercise of native Hawaiian rights or any ethnic group related to numerous traditional cultural practices will not be impacted by establishment of the dairy.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhā'ulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhā'ulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Po'ipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhā'ulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawai'i Department of Health Milk Rules require that potable water be used for milk production, both in the milking

parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhā'ulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhā'ulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhā'ulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kaua'i community.

Regional Water Demand: The adjacent, developed Kōloa-Po'ipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kaua'i will increase county-wide by 17,300 residents by 2030. The South Kaua'i population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kaua'i region (the Kōloa - Po'ipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhā'ulepū Surface

Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhāʻulepū watershed.

The HDF site is located on the bottom-land of the upper Māhāʻulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Haʻupu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhāʻulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kauaʻi Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhāʻulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhāʻulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhāʻulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Po'ipū region were also calculated. Nitrogen input to the marine environment in the Po'ipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Po'ipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kaua'i community.

ALTERNATIVES: As a part of the DEIS, alternatives were evaluated that could attain the objectives of the action's purpose and need, and were compared with environmental benefits, costs, and risks of each reasonable alternative against those of the proposed dairy project. Further discussion of alternatives can be found in DEIS Section 6.

The DEIS evaluates alternatives that could attain the objectives of the action's purpose and need, and compares environmental benefits, costs, and risks of each reasonable alternative against those of the proposed action. Additionally, reasonable land use alternatives that emerged from public input during the project scoping phase are documented and briefly discussed. The alternatives that do not meet the project purpose are not advanced for analysis of environmental benefits,

costs, and risks. The Environmental Impact Statement Rules, Hawai'i Administrative Rules Chapter 11-200 (HRS 11-200) requires a discussion of alternatives that could attain the objectives of the action, regardless of cost. There is no requirement for the alternatives analysis to consider every possible land use.

Four possible land uses that would not meet the project purpose are discussed. Rezoning the land for resort or residential development, or a potential conservation condemnation are two uses that were examined and eliminated from analysis. These options would not be reasonably viable given the existing private land tenure and existing zoning. Two additional alternatives were considered as reasonable land uses as they could be permitted within the existing State Land Use Agricultural District and County Agricultural Zoning District. These options include Agricultural Park with Processing Center, and development of an Agricultural Subdivision. The alternatives were examined and eliminated from further analysis, however, as they would not fulfill the project purpose.

The analysis, therefore, focuses on alternatives that meet the project purpose. Rigorous exploration and evaluation of the environmental impacts of the alternatives, including those that might enhance environmental quality or avoid, reduce or minimize some or all of the adverse environmental effects, costs and risks. These alternatives include: (1) the development of a Conventional Feedlot Dairy (a non-pasture-based dairy) at the same location; (2) development of the Pasture-Based Dairy at an Alternative Location on Kaua'i; and (3) milk products processing by HDF. The alternative of "No Action" is also evaluated.

The alternatives analysis provides a comprehensive evaluation of the range of potential alternatives, including the two alternative development scenarios. Although the alternatives are potentially reasonable uses under existing zoning and neighboring uses, each fails to comprehensively fulfill the project requirements defined by the eight Project Objectives and the four established Evaluation Criteria (Chapter 2, Sections 2.3.3 and 2.3.4).

The essential differences as compared to the proposed action are highlighted in the following statements.

- Only one of the alternative actions (conventional feedlot alternative) would create a commercial scale dairy operation in Hawai'i, with the capability to produce 10 percent of the State's fresh milk demand thus reducing dependence on imported milk (Objective 1). This alternative, however, would not reduce reliance on costly imported fertilizer and feed (Objective 2); grow local, quality grass as a primary feedstock (Objective 3); and would not utilize 100 percent of manure on site as nutrients to grow forage for dairy cows (Criterion 4).
- None of the alternatives would secure a dairy location that meets the requirements for a pastoral, pasture-based grazing dairy: sufficient contiguous land area; available long-term land tenure; adequate potable water supply; suitable soil properties; gentle slope conditions; and accessibility (Criterion 1).

- One alternative (Agricultural Park) could potentially generate new long-term employment in the agricultural sector on Kaua'i in a wide range of positions including pasture agronomy/soils science, environmental resources management (Criterion 2).
- The Agricultural Park alternative could also develop sustainable food production utilizing Important Agricultural Lands, demonstrating the importance of long-term agricultural leases and capital investment for agricultural infrastructure, water systems and support facilities. (Criterion 3). However, after years of trying, it appears there was limited interest in such a venture.
- Finally, addressing the range of potential environmental impacts (natural, cultural, social and economic) (Objective 8) the two alternative development scenarios would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.

In contrast to the other options considered, the planned agricultural operation of Hawai'i Dairy Farms, was determined to be the most viable option and is the preferred alternative. Of all the alternatives considered, this is the only approach that achieves project objectives and meets each of the four Evaluation Criteria.

- Hawai'i Dairy Farms will create a commercial scale pasture-based dairy operation in Hawai'i, with the capability to provide more than 1,000,000 gallons of the fresh milk demand, reducing dependence on imported milk (Objective 1).
- The planned dairy location meets the requirements of minimum land area, soil properties, slope conditions, water supply, land tenure and availability, and accessibility (Criterion 1).
- The planned action will generate new long-term employment in the agricultural sector on Kaua'i, including pasture agronomy/soils science, veterinary and animal husbandry, environmental resources management, milk/milk processing, and dairy business management (Criterion 2).
- Sustainable food production utilizing Important Agricultural Lands (Criterion 3) will occur with the proposed action, demonstrating the importance of long term agricultural leases, and the ability to draw capital investment for agricultural infrastructure including water systems and support facilities (Criterion 3).
- Address the range of potential environmental impacts by utilizing 100 percent of manure as natural fertilizer to grow the majority of food for cows (Criterion 4). The alternatives evaluated would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.
- Creating an economically viable pasture rotational-grazing model maintains agriculture, retains open space, and provides buffer between highly utilized resort and residential development and sensitive natural or cultural resources (Objective 8).

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

RECEIVED

FEB 23 2015

GROUP 70 INTL

1.) State of Hawai'i, Department of Health, 1250 Punchbowl Street, Honolulu, HI 96813. Contact: Laura McIntyre, (808) 586-4337
2.) Group 70 International, Inc., 925 Bethel Street, 5th Floor, Honolulu, HI 96813.
3.) Hawai'i Dairy Farms, LLC., P.O. Box 1690, Kōloa, HI 96756-1690 Contact: Jeff Overton, (808) 523-5866, HDF@Group70int.com

February 19th, 2015, Koloa, HI 96756

Comments submitted regarding HDF Environmental Impact Study (E.I.S.):

Aloha,

My legal and hereditary name is *Kalanikumai Ka Maka'uli'uli 'O Na Ali'i Hanohano*. I was born in, and am a native resident of Koloa, Kaua'i. I am established (SHPD), as a lineal descendent of the aboriginal Stewards (7th generation), of the Koloa *Moku*, or District, which includes *Maha'ulepu*. My *Kupuna*'s "*Anakala*" or Uncle, *Kaluhimoku Nakapa'ahu*, was a noted native medicinal practitioner (Marvin Brennecke 1953), who gathered medicinals in *Maha'ulepu* and *Pa'a*. His father, *Kailipoloahilani Nakapa'ahu*, *Ali'i Nui* of Koloa District (*Moku*, owned, and resided on a nine acre parcel in *Aweoweonui* (Hidden Valley- adjacent to *Maha'ulepu*). I have followed in his footsteps for more than a quarter century. As a native spiritual practitioner representing a registered Hawaii non-profit interfaith Ministry (*Hui Hanai*), continuing cultural practices and observances at *Maha'ulepu*, this Dairy will affect cultural resources that I am dependent upon. I proclaim myself to be a vested party-at-interest seeking intercession status.

As a participating member of the *Ilioula'okalani* Coalition, alert to incursions or intrusion on Cultural sites or practices; as Pastor of *"Hui Hanai I ka Honua La'a"* a registered non-profit Interfaith Ministry; as Steward of: *"Malama Maha'ulepu" 501 c-3)*; "Friends of *Maha'ulepu*" and *Koloa 'Aha Moku* Council, I do not speak for or represent those organizations, but share with them and desire address of their, and my, concerns.

I will be directly impacted by the Dairy installation introducing high volumes of nitrate rich untreated solid waste and urine affecting **three precious qualities** to which I, and the Community have inalienable rights, that of **Clean Water**, **Environmental** contaminate **protection**, and **Quality of Life.**

Neighbors in the nearby communities of Kaua'i's South-Shore will also be impacted by the degradation of water quality (ocean & aquifers), contamination of soil, odors carried by prevailing winds, or lack thereof, biting flies, affecting residential and Visitor Destination "Quality of Life" issues along with economic collapse of one quarter of the Island's tax-base.

Land and aquatic life in the downslope and drainage watershed from the proposed site will be impacted by the inability of HDF to achieve complete containment of seepage resulting from the Dairy operation into the surrounding areas. This is substantiated by the NRCS Custom Soil findings commissioned,distributed, but not taken into consideration by HDF.

ISSUE of conflict w/ use of Group 70 conducting the E.I.S.: "Group 70" developed the existing Waste Management Plan and prepared architectural blueprints for all of HDF's proposed Dairy installation. As analysis of this Plan and projections has been reviewed by qualified independent experts to contain serious flaws and misrepresentations questioning the credibility of their research and facts, does it not stand to reason that in the interest of propriety and competency, that an unbiased third party conduct the E.I.S.?

HDF & "Group 70" have failed to address: The NRCS Custom Soil Study findings (6/05/14) determining that 50% of the proposed farm soil is at HIGH or VERY HIGH risk of run-off; Issues presented in the **Mark Madison** review and report (submitted by Kawailoa Corp).

Point by Point Specific issues needing to be addressed by the E.I.S. :

I: (Involving an irrevocable commitment to loss or **destruction of any natural or cultural resource)**: Introduction of Waste material and nitrate inundation will destroy viability of Valley floor's grey hydromorphic soil to birth and produce *Kalo*.

2: (Curtailing the range of beneficial uses of the environment; (for plants, animals or humans): Seepage from Dairy operation will irreparably damage viability of the (formerly established) Salt Pans, a sustainable native resource gathering practice unique to Hawai'i among Pacific Islanders.

3: No comment at this time.

4: (Substantial affectation of the **economic or social welfare of the community** or State): Pernicious odors, biting flies, noise pollution during seasonal events of wind cessation (*Kona* convective layer zone), beach & shoreline closures due to water bacterial counts plummeting property values, loss of Visitor business, Quality of life impacts with odors, Convention and accommodation cancellations, employment losses, Changes detrimental to the public good.

5: (Issues that **substantially affect public health):** Biting flies, Odors, Water (drinking & Ocean),contamination issues.

6: No comment at this time.

7:(Involving a substantial degradation of environmental quality): Impact of biting flies, odors, and bacteria from aerosolized and deposited manure, **ammonium interaction**, nitrate concentration buildup and seepage into proximate ditches and downslope watershed impacting Wetlands, *Kalo* cultivation, aquatic resources, reef, beaches, habilitation, Wilderness quality, as well as native, resident, and visitor recreational experiences.

8:(Is individually limited but cumulatively has considerable effect upon the environment or **involves a commitment for larger action)**:
The submitted Plan professes to initiate operations with an initial herd size of 699 (gestating) cows, expanding to a milk-producing herd size of 2,000. The Plan fails to address the impact and implications of the increased bovine population distribution island-wide necessary to support the Milking herd.

A reasonable extrapolation of the 1398 (adjustable for attrition), initial added population subsequent to birthing would result in approximately 50% heifers, the remainder would be channelled to Kaua'i's beef industry. Non-gestating, nascent, or pre-gravid cows would add to the supportive and alternative use population. With such increased impact from up to twice the projected herd size being distributed on Island, what plans are in place to process and distribute the increased volume, and what systems are developed to ensure and protect Public and environmental health as a result of the increased presence.

9: (Substantially affects a rare, threatened, or endangered species, or **it's habitat)**: The protected Hawaiian Blind Wolf Spider and it's amphipod prey co-exist in the substrate level of

lava tubes permeating the impacted area; *Nene, Limu, Opihi, Wana,He'e, Loli; Honu,* & Monk Seals, vegetation and sea-life important to Hawaiian culture and PASH resource management populations are at risk from run-off and inundation.

10: **Detrimentally affects air or water quality** or ambient noise levels: Odors, biting flies, bacterial colonies, ambient noise during seasonal cessation of winds, penetration into public water supply, ammonium interactions with the ambient atmosphere affecting vegetative growth.
Issues of Water quality, contamination of public drinking water, penetration of contaminants into the aquifer; soil and lava tube run-off projections calculated to include events such as the 1948 Forty-two day and 2006 30-plus day rain events.

11: (Affects or is likely to suffer damage by being located in an environmentally sensitive area such as a flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, fresh water or coastal water):
Soil categorization by NRCS as High to Very High risk of run-off impacting Wetlands, beach zones, estuaries, tide-pools, reef, coastal and shoreline waters insure eventual widespread damage as suffered by New Zealand, Washington State, Wisconsin and New Mexico.

12: No comment at this time.
13: No comment at this time.

The 2001 Office of Hawaiian Affairs Report to Jennifer Dines of the Federal Communications Commission (FCC) identifies the Haupu Range (including it's *Maha'ulepu* Valley), as a Hawaiian Spiritual Sanctuary and Mausoleum of Ancestral remains. Widespread native burials throughout the region including the single largest Burial Dune in the Pacific (*Aweoweonui*) establish qualification of "Sacred Spaces" designation as defined and protected under the 1978 Religious Freedom Act (American Indian [i.e., *indigenous natives/ Alaska; Hawaii/ American Samoa*].

Unmarked sites, burial grounds, ceremonial "*Wahi Pana*", Sub-surface cultural layer material, proximate wetlands known but undisturbed, require a thorough cultural resources study and ensure mitigation measures to ensure protections.

Consider impact to and degradation of indigenous cultural use of natural land and aquatic resources protected under PASH.

Alternative uses of area: Restoration and encouragement of *Kalo* (Taro), cultivation and production of a **natural resource (*Kalo*) qualifying for protection under the U.S. Supreme Court [1934] "Religious Freedom" determination that "Catlinite" (Pipestone), was a protected "Spiritual" natural element integral to established indigenous religious practices.**
The Court codified protections ensuring that the metamorphosed natural ceramic conductive substance,religiously employed as a Spiritual conductor, would be protected and available to recognized tribal members at no cost using traditional seasonal harvesting techniques.(decision subsequently bolstered by President Clinton's 1978 Executive Order).
As it is well established that every part of the process in Hawaiian *Kalo* cultivation, preparation and ingestion is **a religious act**, in honouring "*Haloa*", a recognized cultural deity, the **rare hydromorphic** "plastic-like" clay soil providing the optimum conditions for *Kalo* cultivation qualifies for protections under "best and highest use" of the land as well as PASH protection as a rare natural resource culturally sustained in Religious practice.

(similarly protected culturally used natural resources used in Religious practices include *Awa* (Kava), *alae* (mineral), "*Ichneich*" (Indian Celery), and Peyote).

Alternative agricultural uses: Bio-mass generation. Sustainable energy production; endemic biodiversity and cultivation of medicinal herbs such as Cats-claw, *Olena* (Turmeric), crops of Taro, sweet potato or yams, conforming to the "highest and best" sustainable practices of land use.

Fails to address :Overflow discharge of effluent ponds resulting from tropical storm and hurricane rainfall amounts historically reoccurring with frequency over affected area with high to very high run-off potential.

Proximity of Ditch to Milking facility yard and "lot" sized rotating pens vulnerable to nitrate penetration. "Lots" of open rotating four to five acre fenced parcels, cannot sustain intended herd population size with adequate room,native and introduced grasses, subsequently requiring an estimated 28% supplemental imported grain based feed with no details as to it's source or GMO status. As such, it fits the definition of a "Feed Lot" (albeit rotating) operation subject to additional limitations, controls and restrictions on operation.

Employment of mechanized distribution of aerosolized manure with re-deployable equipment crossing or in proximity to ditches, well sites, or seasonal wetlands used by native endangered waterfowl is in conflict with reviews of current industry standards and practices.
Note: The American Public Health Ass. (also Canada & Michigan) have called for a Nationwide Moratorium on industrialized Dairy operations (2003) such as this present Plan. Does HDF contest or refute these findings? How do they substantiate this?

Implications of the totality of increased cattle populations on Kaua'i resulting from maintaining consistency of Dairy herd size, i.e., How many heifers, steers,cows (inactive or nascent), will be in addition to an eventual Milking herd of two thousand cows?

Issue of a flawed and inadequate Cemetery Plan failing to contain nitrate penetration into downslope watershed. Current projections fail to address aftermath of catastrophic events from weather or disease. Designation of a 694 foot double row of internments two feet apart cannot adequately provide sanitary containment. Furthermore, seepage and penetration into downslope watershed is inevitable and deleterious to the environment.

The watershed of Maha'ulepu Valley (and HDF's proposed 578 acre industrial dairy site) comprises waters from the Haupu mountain range, the Wai'opili Stream, as well as the irrigation ditches, all of which are "hydro-logically linked" as they emerge and converge at the Makauwahi Cave on their direct path to the ocean. Based on that critical feature, all waters being hydro-logically linked, how can HDF protect the wetlands, the endangered species, the reefs, the rare and sacred sites and the ongoing native Hawaiian cultural practices from contamination caused by the massive amounts of wet manure and urine produced daily even with their start-up herd of 699 pregnant dairy cows? Short of lining the entire surface of the proposed farm site, the established hydrological link between the various components of the Maha'ulepu watershed make runoff, discharge and contamination unavoidable.

For the aforementioned concerns and issues raised, I urge that HDF agree to an alternative contractor to perform the E.I.S. and address of all issues raised or alluded to in these comments.

I again urge *Olapua*, HDF, and Grove Farm Co. to reconsider and relocate their intended Dairy operation to a more appropriate location.

Kalanikumai Ka Maka'uli'uli 'O Na Ali'i Hanohano
P.O. Box# 1551, Koloa, HI 96756
<nurture.hope@hawaii.rr.com>
(808) 332-0718

GROUP 70 INTERNATIONAL

May 26, 2016

Kalanikumai Ka Maka 'uli 'uli 'O Na Ali'i Hanohano
P.O. Box 1551
Koloa, HI 96756
nurture.hope@hawaii.rr.com

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Kalanikumai Ka Maka 'uli 'uli 'O Na Ali'i Hanohano:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

GROUP 70 OBJECTIVITY: Group 70 International, Inc. (Group 70) is responsible for the preparation and processing of the Hawai'i Dairy Farms Environmental Impact Statement (EIS). The EIS was prepared in accordance with the requirements of Chapter 343 Hawai'i Revised Statutes and the "Environmental Impact Statement Rules" (Chapter 200 of Title 11, Hawai'i Administrative Rules). The environmental planning team at Group 70 has prepared several hundred Environmental Assessment and EIS documents over the past 40 years, and every document has been accepted by the responsible County, State and Federal agency. On numerous past EIS projects, the Hawai'i Chapter of the American Planning Association has recognized Group 70's professional work with Chapter awards for excellence in environmental planning. Part of the EIS scoping process involves Group 70's

experienced team of technical sub consultants that are well-known and qualified in their respective fields of study. For this project, Group 70 is preparing the Hawai'i Dairy Farms EIS with the level of analysis required to properly evaluate and disclose the existing environmental conditions, probable impacts with mitigation, and potential cumulative and secondary effects.

DAIRY OPERATIONS: Hawai'i Dairy Farms (HDF) will establish and operate a sustainable, pastoral rotational-grazing dairy farm in Māhā'ulepū Valley on the island of Kaua'i to produce fresh, locally available nutritious milk for Hawai'i families. The rotational-grazing method utilizes 100 percent of the cows' manure as natural fertilizer to grow pasture grass as a primary source of nutrition for dairy cows. This cost-effective method will reduce reliance on imported fertilizer and feed. Pasture grass will comprise at least 70 percent of the animals' diet. As a part of the Draft Environmental Impact Statement (EIS), the proposed facilities and operations for the dairy farm are described in Chapter 3.

The Environmental Impact Statement (EIS) Preparation Notice (EISPN), published January 23, 2015, described the proposed pasture-based rotational grazing system as a "zero-discharge, grass-fed dairy". The term "zero-discharge" under the U.S. Environmental Protection Agency related to concentrated feeding operations (CAFO) is a system designed to not discharge pollutants into waters of the United States. As noted previously, the HDF system is designed to utilize 100 percent of the cows' manure on-site. However, nutrients would be introduced to the HDF site with any use; the Draft EIS identifies the amount of nutrients anticipated from the proposed dairy operations that could pass through to ground and surface waters. Therefore, HDF elected to discontinue use of the term "zero discharge" as it was construed as no nutrients into the system.

The term "grass-fed" was used in the HDF EISPN. This term was used to identify HDF's intent to utilize a locally-produced feedstock – grass – for more than 70 percent of the dairy herds' diet. In January 2016, the U.S. Department of Agricultural (USDA) Marketing Survey created a narrow legal definition of "grass-fed". The USDA standard defines what animals can and cannot be fed. The Food Alliance, a project of several northwest colleges, believes that when consumers choose grass-fed products there is an expectation that these will come from animals raised on pasture on a forage-based diet. Due to the evolving definition of "grass-fed", the term in not used in this EIS.

The dairy facilities will occupy an area of approximately 10 acres on the western boundary of the site. The developed area "footprint" will be less than 2 percent of the total farm area. Four buildings will be constructed to serve different functions, supported by utilities and infrastructure. Additional building information can be found in Draft EIS Section 3.3.1.

Agricultural infrastructure and utilities required for the dairy operations will include storage tanks and silos, effluent storage ponds, livestock water systems, and drainage improvements. The irrigation system and distribution of livestock water are discussed in Draft EIS Section 3.5, Pasture Management.

The pastoral rotational-grazing dairy provides a local feedstock – grass – as the herd's primary food source. Reducing imported feed stabilizes costs and provides a food source closer to the natural diet of cows. Results of grass trials initially conducted at five sites across four Hawaiian Islands were instrumental in identifying appropriate varieties of grass, and suitable sites to support sufficient "dry matter" grass yields essential to a cow's diet. Additional project-specific trials at the Māhā'ulepū site on Kauai have been conducted for more than 18 months. The results have identified sufficient yield and nutrition to supply 70 percent of the cows' diet; improvements in grass productivity are anticipated to provide up to 85 percent of cows' diet.

The pasture-based model allows cows to move about freely, and to lie down and rest, which is part of the digestion cycle. The animals are managed in social groups known as "mobs", mimicking the natural social order of bovines. Cows spend 22 hours of each 24-hour period foraging on pasture or resting, outdoors in natural light and fresh air. The gently sloped paddocks, walkways and races minimize the energy expended by the mature dairy cows as they graze or are transferred to and from the various paddocks and the mature dairy facility; surfaces of the walkways and cow races are designed to provide a comfortable path under hoof. The management practices and pasture model applied by HDF maximizes grass as the cows' primary nutrition source and minimizes stress to the animals. Cows tend to be healthier and live longer, productive lives with access to fresh air, high quality feed, and exercise while they forage.

The 470 acres of pasture will be divided into paddocks averaging 3 to 5 acres in size. Smaller paddocks located near the dairy facility will be used as temporary pasture for cows or calves being moved on or off the farm. To protect the water quality of surface water and downstream areas, paddock fences are set back 35 feet from the edge of drainage ways throughout the site. Existing vegetation within the setbacks will be managed or restored to reduce erosion, improve stability of ditch banks, increase net carbon storage, and improve and maintain water quality.

The majority of the pastures will be irrigated with non-potable water and/or diluted effluent through either the pivot irrigation systems or through gun irrigators. Irrigation water supply is provided to the farm from Waita Reservoir, and will be filtered and pumped to the various irrigation components on the farm. The irrigation system is controlled using computer software and GPS receivers to allow very precise application of irrigation and/or diluted effluent on the pasture. The pivots can rotate and apply irrigation water and/or diluted effluent at different rates depending on the actual irrigation needs of the farm.

NRCS provides technical guidance on applying agricultural waste depending on the desired use of the waste. Reflected in the title of the livestock waste guidance for Hawai'i is the parenthetical inclusion of the word "nutrients." Where waste is utilized as a resource, it is being used for the constituent components that provide benefit.

The NRCS Conservation Practice Standard 590, Nutrient Management, applies to commercial fertilizers, organic by-products, waste water, organic matter, and

irrigation water. Nutrient management is the practice of managing the amount, rate, source, method of application, and timing of plant nutrients and soil amendments. The timing and application of nutrients will correspond with plant uptake, soil properties and weather conditions. For more information on nutrient balance management see Draft EIS Section 3.5.3, and Draft EIS Appendix D.

The effluent storage ponds are sized to accommodate 30 days of storage for up to 2,000 mature dairy cows, and over 85 days of storage for 699 mature dairy cows. It will be highly unlikely that the storage pond will be full at any time for the contemplated 2,000-cow dairy, and nearly impossible for the committed 699-cow dairy. Throughout the less than 30-day storage period, effluent is planned for application every four days, and the slurry application is expected at least once every 45 days, to ensure that the ponds are kept at manageable levels.

Cows lactate milk following the birth of calves. Newborn calves will be housed on the Māhāʻulepū site and provided essential colostrum and nutrients for a healthy start. During the calves' initial 90 days, they will be transitioned to pasture at HDF before transfer to ranches on Kauaʻi to be raised off-site. The committed herd size of 699 mature dairy cows at the Māhāʻulepū site applies to mature mature dairy cows. Animals in various stages of lactation and rest will be transferred between HDF and other partner ranches as needed for animal health and dairy productivity. This will benefit both the dairy and infuse the beef market in Hawaiʻi with a new, local source of pasture-raised calves. Male calves will become part of the beef cattle herd; heifers (young female calves that haven't given birth) will be raised until ready to return to the HDF herd as a birthing/mature dairy cow. For more information on off-site herd management, refer to Section 3.7 of the Draft EIS.

Health of the herd is of primary importance as the success of a dairy relies on cows effectively producing quality milk. All cows will be treated with a high standard of care. Dairy managers and caretakers will be trained and competent in handling animals to minimize stress and ensure the herds' welfare. A licensed veterinarian may prescribe use of antibiotics approved by the Food & Drug Administration (FDA) for treatment of illnesses. Adherence to guidelines that prohibit milk from cows undergoing antibiotic treatment will ensure no adulteration of milk. Routine laboratory tests of milk for traces of antibiotic residue will be conducted. HDF will not inject cows with bovine growth hormone, referred to as rBST or rBGH.

SOILS: Soil is an ecosystem that can be managed to provide nutrients for plant growth, to absorb and hold rainwater for use during dryer periods, to filter and buffer potential pollutants from leaving fields, to serve as a firm foundation for agricultural activities, and to provide habitat for soil microbes to flourish and diversify to keep the ecosystem healthy. Two rounds of independent soil sampling were undertaken at HDF to understand and characterize available soil nutrients and conditions. Section 4.3 of the Environmental Impact Statement (EIS) characterizes soil conditions, and anticipated impacts from effluent and supplemental nutrient application. Recommendations from Dr. Russell Yost and Nicholas Krueger of the University of Hawaiʻi at Mānoa are summarized. Their baseline nutrient report is included as Appendix C of the Draft EIS.

Soil conservation is a core principal behind establishment of the NRCS, which was formed out of the Soil Conservation Service to acknowledge its expanded role in watershed-scale approach using science-based tools and standards in agronomy, engineering economics, wildlife biology and other disciplines to aid landowners in implementation of conservation practices. NRCS conservation practices are listed in Chapter 3, Section 3.2; these practices codes identify design and construction standards related to drainage, materials, operations and applicable engineering standards. HDF will follow the developed Conservation Plan, which was approved by the West Kauaʻi Soil & Water Conservation District in December, 2013.

The United States Department of Agriculture (USDA) Natural Resources Conservation Services (NRCS) has mapped and classified soils for more than 95 percent of the United States. Comments received during the initial scoping for this EIS included a "Custom Soils Resource Report for Island of Kauaʻi, Hawaiʻi." The report was generated from the USDA NRCS website, which allows any internet user to define an area of interest, customize data results, and generate a Custom Soil Resource Report. The user can select or deselect parameters based upon which data the user would like to display. These user-generated reports are not evaluated by NRCS.

The NRCS soils classifications and descriptions provide a good information base, however, in-field soils testing is needed to identify existing soil nutrient levels and conditions. The most abundant soil types at the HDF site are Kalihi Clay at 32 percent, Kaʻena Clay Brown Variant at 29 percent, and Lualualei Clay at roughly 14 percent of the dairy site. Laboratory analysis of soil samples collected in 2014 identified levels of pH, phosphorus, nitrogen, potassium, calcium, magnesium, organic matter, salinity, micronutrients and other constituents. The results illustrate that the soils are depleted of nutrients, which is typical for lands formerly used for sugarcane. The soil nutrient status and fertility demands of the primary crop, Kikuyu grass, were used to identify the quantities of nutrients required for productive grass growth. The soils data provide a baseline to guide adaptive nutrient management throughout establishment and maturity of the dairy.

A second round of field sampling was conducted in 2015, and focused on evaluation of soils characterized as "poorly drained", and established a quantitative baseline of soil salinity and sodicity to provide for future monitoring of soil health with application of manure effluent. Laboratory analysis determined electrical conductivity and exchangeable sodium percentage, in addition to nutrient levels of nitrogen phosphorus calcium, magnesium, and potassium.

Poorly drained is not an indication of low or poor infiltration. Infiltration refers to the ability of water to enter the soil surface, whereas "drainage" refers to the movement of water within or from the soil profile. Poorly drained soils typically have low hydraulic conductivity, or a slow rate of groundwater movement through the soil. This slow movement can create anaerobic conditions, which typically result in higher rates of denitrification. This is the conversion of potentially nitrates and nitrites to gaseous forms, which reduces the potential for impacts on waterbodies. In this way, "poorly drained" soils may represent less risk of nitrate and nitrite leaching to associated waterbodies than "well drained" soils (Yost, 2016).

As a result of reduced movement of water through the soil profile, the mobility of nutrients such as potassium and phosphorus is also reduced. Soil types at the HDF site are known to adsorb and retain large amounts of phosphorus. Under the NRCS phosphorus leaching index for Hawai'i soils, HDF soils show low risk for leaching. With low risk, phosphorus can be applied at rates greater than crop requirements if manure or other organic materials are used to supply nutrients.

The dairy's focus on robust and healthy grass growth will build organic matter in soils through use of manure as a natural fertilizer. Soil can incorporate carbon from the atmosphere, which benefits soil health. According to recent studies in the Soil Science Society of America Journal, the conversion of formerly tilled cropland to grazed pasture can drive substantial accumulation of organic carbons in soil, with a potential to offset up to one-third of the annual increase in atmospheric carbon dioxide. The potential soil organic matter and carbon dioxide sequestration benefits are likely greatest in highly degraded soils in warm subtropical climates, partly due to long pasture-growing seasons. Long-term soil impacts are anticipated to result in improvement to the physical, chemical, and biological condition of the soil.

ARCHAEOLOGICAL AND CULTURAL: The Hawai'i Dairy Farms (HDF) project is subject to a historic preservation review by the State Department of Land and Natural Resources, State Historic Preservation Division (SHPD) under HRS Chapter 6E and Chapter 13-284. An Archaeological Inventory Survey (AIS) and a Cultural Impact Assessment (CIA) were conducted by Scientific Consultant Services (SCS) for the proposed project. EIS Sections 4.7 and 4.8 provide an evaluation of archaeology and cultural resources, with technical studies in Appendix G and H.

A total of sixteen historic properties were identified through a pedestrian survey of the project area and an extended survey area of 100 meters of the northern boundary. Six historic-era sites occur in the project area and 10 sites occur in the extended survey area. Only one of the sites is believed to be associated with pre-Contact and/or early historic times. State Site 50-30-10-2250, the agricultural heiau, and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area. The remaining sites consist of historic-era bridges, ditches, culverts, retaining walls, and a flume system dating from the 20th century and are affiliated with sugarcane cultivation.

That a majority of the documented sites are related to the historic-era is not surprising, given the massive landscape modifications that occurred during intensive sugarcane cultivation on the valley floor. Even historic era cultural materials associated with the many Land Commission Awards in the project area were non-existent, as explored through survey and subsurface exploration.

The sixteen historic properties have been assessed for significance by the archaeological consultant and the dairy project is anticipated to have no impact on these sites. No further archaeological work is recommended for the sites. Two of the sixteen sites are considered significant under multiple criteria, but occur outside the project area on lands owned by a different landowner. Both sites will not be adversely affected by the proposed dairy project. No site is related to burials, and no bonex were found. Such sites have been reported along coastal areas in sand dunes.

The cultural assessment examined the potential effect of the project on cultural resources, practices or beliefs, its potential to isolate cultural resources, practices or beliefs from their setting, and the potential of the project to introduce elements which may alter the setting in which cultural practices take place. Information received from the community indicates the Māhā'ulepū Ahupua'a, has been and is currently used for traditional cultural purposes. However, the dairy project area has not been included in these activities. It is clear that the gathered plants, trails, State Site 50-30-10-2250, the agricultural heiau, and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area.

The project will be fully enclosed by perimeter fencing along the boundary of the leased premises, which will ensure that project activities and any related impacts are contained within the project area. Based on the research and comments received from the community, it is reasonable to conclude that, pursuant to Act 50, the exercise of native Hawaiian rights or any ethnic group related to numerous traditional cultural practices will not be impacted by establishment of the dairy.

FLORA AND FAUNA: Botanical, avian, and mammalian surveys of the property were conducted for the Draft Environmental Impact Statement (EIS) to assess existing species on site, including identifying any species listed as endangered, threatened, or proposed under any state or federal endangered species programs in or near the property. EIS Sections 4.9 and 4.10 address the evaluation of flora and fauna resources, with technical studies in Appendix A and B.

A botanical survey of the dairy property was conducted in August 2014 by AECOS Consulting to assess existing plant species. The survey also investigated for the presence of plants currently listed as endangered, threatened or proposed for listing under Federal or the State of Hawai'i's endangered species programs, located onsite or within the immediate vicinity of the dairy site. The nature of the land and its present and historical uses for intensive agriculture very much limit the natural botanical resources anticipated to occur on this land. Complete species lists are included in the EIS, and no protected botanical species occur on the project property. The project will include vegetated buffer strips along the drainage ways as part of the Conservation Plan to reduce erosion and stabilize slopes. Where native plants occur or could survive if planted, native plants will be used in the stabilization. No long-term impacts to native plant habitats or endangered or threatened plants species will occur as a result of the dairy.

Avian and mammalian surveys were conducted in August 2014 by Rana Biological Consulting, Inc. This survey was conducted to assess the potential presence of avian or mammalian species currently listed as endangered, threatened or proposed for listing under either Federal or the State endangered species lists. The survey covered the dairy site area and immediate vicinity. Common birds and terrestrial mammals were encountered on the property. There is no critical habitat for endangered species in the upper Māhā'ulepū Valley.

Four species of endangered waterbirds were recorded on the site and at the nearby taro farm located within the HDF site. Though the area does not provide critical habitat, seabirds that nest in upland areas of Kauai may overfly the site. The

endangered Hawaiian goose, nēnē was also seen on the site. State Division of Forestry and Wildlife biologists have noted nēnē are regularly seen on the subject property. It is probable that some nest on or adjacent to the site as this species nests in the general Kōloa area, and the habitat present on parts of the site is suitable for nēnē nesting.

The principal potential impacts posed to the five endangered species include those potentially associated with construction activities, and those associated with dairy farm operations following build-out. Measures will be adopted to avoid potential seabird and nēnē goose collisions with fences and structures. Potential measures include lowering construction cranes at night, using conservation fencing to project-specified areas, marking tall structures and fencing with white visibility polytape, limiting nighttime lighting, and shading any outside lights used at night. Ongoing mitigation strategies will be implemented for day-to-day preventative measures, including an Avian Species Protection Plan. Mitigation measures are further described in DEIS Section 4.10.2.

It is also likely that Hawaiian hoary bats overfly the project area on a seasonal basis. While caution will be taken during any potential disturbance or vegetation removal, there are almost no suitable roost trees within the dairy site, thus it is expected that the dairy farm will not affect this listed mammalian species.

INVERTEBRATE SPECIES: A study of invertebrate species and pest insects was conducted by Steven Lee Montgomery, PhD, Consulting Biologist. The study summarizes the presence or absence of native species or pest species associated with cattle manure in the general Māhāʻulepū area, as well as the parasites and predators on site that control those species. Fieldwork was conducted during September 15-16, 2014. The entire study is included in Draft Environmental Impact Statement (EIS) as Appendix B.

CAVE AND LAVA TUBE INVERTEBRATES

There are no known caves or lava tubes found at or adjacent to the dairy farm property. The Kōloa Lava Tube System, which provides habitat for two endemic cave species, the Kauaʻi Cave Wolf Spider and the Kauaʻi Cave amphipod, is located several miles away from the dairy farm property. Both invertebrates are listed as endangered under the U.S. Endangered Species Act. Not all caves in the Kōloa area contain these invertebrates, as many do not contain the optimal climatological conditions required by these organisms. Neither the botanical and faunal survey nor the invertebrate survey revealed any evidence of lava tubes or caves on the property, and no such features have been reported for the area near the Hawaiʻi Dairy Farms (HDF) site. Thus no cave invertebrate species will be affected by the dairy farm.

INTRODUCED PREDATOR INSECTS

An invertebrate study of manure-associated insects was conducted for the Draft EIS. The study included a field survey that used manure from an adjacent beef cattle herd as a lure, and determined flies and other manure-related insects currently

present at the HDF site. Pest insects such as flies can negatively impact livestock health and production, and are therefore actively managed to prevent stress and loss of productivity at dairy operations.

At the HDF site, two common flies were identified: the stable fly and the horn fly. Both of these flies are widespread throughout the Hawaiian Islands. The greenbottle fly was reared from manure taken back to a laboratory following the field survey. Additionally, flies known to exist on Kauaʻi but not seen at the HDF site during the survey were identified and include the house fly, the dog dung fly, and the chicken dung fly. These pests are common in areas with high pet populations.

In response to cattle-related insect pests, numerous species known to compete with the pests were introduced to Hawaiʻi between 1898 and 1982. Twenty species of predators and competitors to the horn fly were successfully established during that period. Cattle egrets break up dung patties while searching for prey, and were introduced to Hawaiʻi in the late 1950s to control cattle-associated insects. Extensive introduction of dung beetle species resulted in 14 dung beetle species becoming established on Kauaʻi.

A healthy population of dung beetles can bury a dung pat in one to three days, which disrupts reproduction of flies such as the stable fly and horn fly. The stable fly requires approximately 21 days within the dung patty for the immature life stage (egg to pupa) to survive; the horn fly takes 10 to 20 days from egg to adult. Incorporation of the manure into the soil profile by dung beetles removes the habitat these flies require to complete their lifecycle. Research shows that 95 percent fewer horn flies emerged from dung patties containing a dung beetle species that has been identified at the HDF site. Proven control methods for the stable fly include parasitic micro-wasps and spreading out manure.

Among the invertebrates previously introduced to Hawaiʻi to combat livestock-related flies are extremely tiny parasitic wasps that prey on various fly species. The adult wasps could be described as the size of gnat. Using an ovipositor – described by lay people as a "stinger" – the female lays eggs in the larvae or pupa of flies. The male wasp has no such "stinger". See Draft EIS Section 4.11 for a photo providing scale for these tiny, non-stinging wasps.

To minimize potential establishment of pest flies or other insects, food waste generated during the construction phase will be bagged, covered, contained and disposed of in order to limit possible breeding habitat for flies. Inspections of building materials for ants or other insects will be conducted to prevent introduction of new pests to the HDF site. Short-term controls, including mechanical methods (e.g. sticky tapes or ribbons in the milking parlor, or traps with or without attractants) and chemical methods may be used to prevent short-term spikes in pest populations.

Insecticides and herbicides are non-discriminatory and kill beneficial as well as pest insects. Beneficial insects include primary decomposers such as earthworms and dung beetles, and pollinators including bees. Should chemical control be needed for short-term spikes in pest populations, application would be by those qualified, and

in accordance with regulatory labeling requirements. HDF will implement long-term integrated pest management, which utilizes knowledge of the ancient food web among species by disrupting the manure habitat required to complete the fly life cycle. HDF and other ranchers on Kaua'i may choose to engage with the State Department of Agriculture to translocation dung beetle species already introduced on Kaua'i to Māhā'ulepū and other areas where manure-related flies may be a problem.

IMPACT OF SPRAYS ON BEES

Beneficial insects include primary decomposers such as earthworms and dung beetles, and pollinators including bees. Honey bees are an essential part of any agricultural ecosystem, and were observed on site during the invertebrate species survey. Pesticides and herbicides can reduce populations of beneficial insects, which is why HDF will utilize an integrated pest management approach.

It is expected that honey bees will visit water sources set up for the HDF herd. Preventative measures will be built into any open water source to prevent bees from being trapped, and HDF will contact local beekeepers for advice regarding any bees or bee colonies encountered on site. Safe application practices for any unavoidable herbicide or pesticide will be utilized in order to narrowly target the correct pest species without harming other insects and animals in the area. Anyone using herbicides or pesticides will be properly trained and informed, and if a honey bee colony location appears to be a danger to workers or cattle, or to be in danger itself, a local beekeeper will be contacted for advice and removal.

PESTS: A study of invertebrate species and pest insects was conducted by Steven Lee Montgomery, PhD, Consulting Biologist in January 2016. The study summarizes the presence or absence of native species or pest species associated with cattle manure in the general Māhā'ulepū area, as well as the parasites and predators that control those species. No federally or state listed endangered or threatened invertebrate species were noted in the survey of the site. A full report and list of species found on site is provided in EIS Section 4.11 and Appendix B.

Flies were identified on the HDF site using manure from neighboring livestock as bait for invertebrates. The two flies associated with livestock are the stable fly and the horn fly, the latter known for biting cattle. These flies and the greenbottle fly are often confused with the house fly. Flies known to exist on Kaua'i but not seen at the HDF site include the house fly, the dog dung fly, and the chicken dung fly. These pests are common in areas with high pet populations. It is possible these fly species could inadvertently be brought to the dairy and utilize manure as a food source. HDF will prevent and control fly population growth through diligent clean up and sanitation practices regarding any trash and food waste, as well as through efficient manure composting practices. A full list of site management measures is provided in EIS Section 4.11. The project location does not provide any habitat for *drosophila musaphilia*, the only Kaua'i species of native Hawaiian fly listed as Endangered or Threatened. Native Drosophila habitat is located many miles away in the high elevation koa-'ōhi'a forests.

Fly populations at HDF will be minimized through a process known as Integrated Pest Management (IPM). Essentially, IPM disrupts reproduction with appropriate means at key points in the pest's life cycle. Used in Hawai'i for decades, a number of invertebrates and a bird (the cattle egret) were introduced between 1898 and 1950 to reduce livestock-related insects. IPM utilizes knowledge of the ancient food web among species.

An especially important insect to minimize fly breeding habitat in manure is the dung beetle, which buries manure and incorporates it into the soil. Populations of dung beetles found on Kaua'i and those species already in Māhā'ulepū Valley, will increase with the increased manure food source, thus increasing and speeding breakdown of manure. Dung beetles are specialists in the very important natural process of breaking up and quickly recycling bovine manure pads. The behavioral diversity among dung beetle species will work together to bury dung pats in one to three days, a shorter amount of time than the 10-30 days flies eggs need to hatch.

In the Kōloa-Po'ipū region, pest fly populations are dependent upon food and breeding sources nearby such as dog, cat, and chicken feces. Beef cattle graze in the region on agricultural lands along Ala Kinoiki Road between Kōloa and Po'ipū, and it is likely the livestock-related flies identified at the HDF site occur in this region as well. Localized controls to reduce pest populations need to address breeding sites in and amongst the food and animals wastes within the area. These mitigation measures will make it difficult for flies to breed, and BMPs will be enforced to address any increase in population, therefore it is expected that the dairy farm will not significantly affect recreational and resort areas.

DEMOGRAPHIC AND ECONOMIC: The potential impacts of Hawai'i Dairy Farms (HDF) to the existing economy were evaluated in the Draft Environmental Impact Statement (EIS), including a fiscal impact assessment report completed in April, 2016 by Plasch Economics Pacific. Draft EIS Section 4.15 addresses demographic and economic factors, with the complete report in Appendix J.

The HDF project would create short-term benefits through jobs for local construction personnel and local material suppliers. Such jobs would include equipment operators, cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, supervisors, painters, etc. Based on State employment multipliers, indirect employment related to Dairy construction would be expected to average about 16 jobs on Kaua'i, and 8 on O'ahu. Construction employment would be expected to average about 12 jobs per year during the development period. Thus direct-plus-indirect employment association with construction would be expected to average approximately 36 jobs, of which 28 would be on Kaua'i.

The HDF project would contribute to diversification of Kaua'i's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Hawai'i Island), approximately10 percent of Hawai'i's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of

milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and indirect full-time equivalent jobs on Kaua'i, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on O'ahu.

HDF is expected to generate a net income of approximately $68,000 to the County when the 699 cow herd is established. When the dairy has matured to full production for the 699 cow dairy, net income to the State is calculated at $160,000 annually. With the potential contemplated herd size of up to 2,000 mature dairy cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be produced. This would double local milk production currently supplied by operational dairies on the Island of Hawai'i.

Additional employment generated by a possible expansion to accommodate the contemplated 2,000 mature dairy cow herd is estimated at approximately 3 construction jobs plus 4 indirect jobs on Kaua'i, and 2 indirect jobs on O'ahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an additional 5 full-time farm jobs would be added, with approximately 15 additional indirect jobs on Kaua'i and another 8 indirect jobs on O'ahu.

The dairy is expected to generate a net additional contribution to the County of approximately $8,000 for improvements related to expansion for the contemplated herd size of up to 2,000 mature dairy cows ($76,000 total versus $68,000 for the committed herd size). The State will derive approximately $360,000 annually in revenues from the contemplated 2,000-mature dairy cow dairy.

Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhā'ulepū Valley floor is filled with

alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhā'ulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Po'ipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhā'ulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawai'i Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhā'ulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhā'ulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhāʻulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kauaʻi community.

Regional Water Demand: The adjacent, developed Kōloa-Poʻipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kauaʻi will increase county-wide by 17,300 residents by 2030. The South Kauaʻi population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kauaʻi region (the Kōloa - Poʻipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhāʻulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhāʻulepū watershed.

The HDF site is located on the bottom-land of the upper Māhāʻulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Haʻupu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhāʻulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction

Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kauaʻi Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhāʻulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhāʻulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhāʻulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways;

only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Poʻipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal

area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kauaʻi community.

AIR QUALITY: As a part of the Environmental Impact Statement (EIS), existing air quality conditions and project impacts were evaluated, including dust and odor. Potential odors and emission levels for air pollutants relevant to dairy operations were modeled, as currently there are no cows on site. EIS sections 4.19 and 4.25 provide an evaluation of air quality and odors, including a windrose depicting wind speed and direction in the area (see DEIS Section 4.1, Climate). The full air quality technical report can be found in Draft EIS Appendix I.

Clean Air Act

Under the *Clean Air Act of 1970* (CAA), amended November 1990, the U.S. Environmental Protection Agency (EPA) regulates both large and small sources of air pollutants by establishing National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. The State of Hawaiʻi has established its own *State Ambient Air Quality Standards* (SAAQS) that are as strict or, in some cases more strict than the NAAQS. State standards prohibit any visible emissions of fugitive dust from construction activities at the property line.

Emissions relevant to livestock operation include particulate matter and fugitive dust. Greenhouse gases related to dairy cows include methane (CH_4) from enteric fermentation, and both methane and nitrous oxide (N_20) emissions from manure application. No State or Federal regulations for greenhouse gas emissions from farm operations or small businesses currently exist.

DUST

Dust will be generated as cows move along soft limestone walkways that connect the paddocks and lead to and from the milking parlor. Potential fugitive dust emission rates were estimated from published literature, where particulate matter (PM) is measurable from the "drylots" of confined dairy operations where animals walk over dirt and dried manure throughout the day.

Applying the emission rates from this available literature greatly overestimates potential emission resulting from HDF. Cows in the pastoral rotational-grazing system will be on pasture 22 hours each day and will spend two hours – in two separate milking cycles –moving to and from the barn for the 10- to 15-minute milking sessions.

Using atmospheric dispersion modeling system (AERMOD), the rates were scaled to the size of the non-pasture areas used by cows at HDF. Results were added to the background concentration of particulate matter (both PM_{10} and $PM_{2.5}$) measured on the island of Kaua'i, and the total concentration was compared to the State ambient air quality standards. Only the contemplated herd size of up to 2,000 mature dairy cows was modeled, as at the lower threshold of 699 cows, the potential fugitive dust impact would be negligible. The estimated concentration for PM_{10} is 2.01 $\mu g/m^3$, well below the State standard of 150 $\mu g/m^3$. The estimated concentration for $PM_{2.5}$ is 0.23 $\mu g/m^3$, well below the Federal standard of 35 $\mu g/m^3$ (see Draft EIS Section 4.19 and Table 4-19.2).

ODOR

Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF, so air dispersion models were used to determine potential odor levels. Local weather data was used in conjunction with the AERMOD modeling system, and published rates for manure odors emissions for dairy heifers and effluent ponds were adapted to reflect the HDF facilities.

Odor emission sources identified for modeling at HDF were manure in the pasture fields, irrigation water containing diluted nutrients from effluent, the effluent storage ponds, and the dairy buildings. Odor rates from published research were applied. Odor isopleths (a line used to map all points having the same numerical value) were created to display the model findings. Odor is described in "odor units" at the threshold of perception, which is defined by the point at which 50 percent of panelists, in laboratory conditions, cannot smell the odor but 50 percent of the panelists can detect the odor.

Modeling results were generated for worst case meteorological conditions (low wind velocity / mixing). Generally, tradewinds will disperse odors to less than detectable levels beyond the HDF site; in periods of no wind, odor may not be dispersed creating the "worst case" scenario. In these periods without normal tradewind flow, the odor plume would extend to the south of the HDF site. Sections 4.19.2 and 4.25.2 of the EIS include graphics of the potential odor isopleths.

Results for the committed herd size of 699 mature dairy cows show that odors may be detectable by 50 percent of the sensitive population once per 200 hours, or 44 hours per year, within an area that extends approximately 1,670-feet (within one-third of a mile) beyond the dairy farm boundary, and does not reach recreational or residential areas. Results for the contemplated expanded herd size of up to 2,000 mature dairy cows show odors would not extend beyond 2,780 feet outside the HDF boundary (just over half a mile), again not reaching recreational or residential areas, and again with detection limited to 50 percent of the sensitive population approximately 44 hours per year. The parameters used in the analysis were intentionally conservative, and the impacts shown assume an unlikely confluence of worst-case meteorological data, irrigation location, and grazing location. Actual offsite odor impacts are likely to be much lower and/or less frequent than shown; it is likely odor detection beyond the HDF boundaries will be less frequent.

ALTERNATIVES: As a part of the DEIS, alternatives were evaluated that could attain the objectives of the action's purpose and need, and were compared with environmental benefits, costs, and risks of each reasonable alternative against those of the proposed dairy project. Further discussion of alternatives can be found in DEIS Section 6.

The DEIS evaluates alternatives that could attain the objectives of the action's purpose and need, and compares environmental benefits, costs, and risks of each reasonable alternative against those of the proposed action. Additionally, reasonable land use alternatives that emerged from public input during the project scoping phase are documented and briefly discussed. The alternatives that do not meet the project purpose are not advanced for analysis of environmental benefits, costs, and risks. The Environmental Impact Statement Rules, Hawai'i Administrative Rules Chapter 11-200 (HRS 11-200) requires a discussion of alternatives that could attain the objectives of the action, regardless of cost. There is no requirement for the alternatives analysis to consider every possible land use.

Four possible land uses that would not meet the project purpose are discussed. Rezoning the land for resort or residential development, or a potential conservation condemnation are two uses that were examined and eliminated from analysis. These options would not be reasonably viable given the existing private land tenure and existing zoning. Two additional alternatives were considered as reasonable land uses as they could be permitted within the existing State Land Use Agricultural District and County Agricultural Zoning District. These options include Agricultural Park with Processing Center, and development of an Agricultural Subdivision. The alternatives were examined and eliminated from further analysis, however, as they would not fulfill the project purpose.

The analysis, therefore, focuses on alternatives that meet the project purpose. Rigorous exploration and evaluation of the environmental impacts of the alternatives, including those that might enhance environmental quality or avoid, reduce or minimize some or all of the adverse environmental effects, costs and risks. These alternatives include: (1) the development of a Conventional Feedlot Dairy (a non-pasture-based dairy) at the same location; (2) development of the Pasture-

Based Dairy at an Alternative Location on Kaua'i; and (3) milk products processing by HDF. The alternative of "No Action" is also evaluated.

The alternatives analysis provides a comprehensive evaluation of the range of potential alternatives, including the two alternative development scenarios. Although the alternatives are potentially reasonable uses under existing zoning and neighboring uses, each fails to comprehensively fulfill the project requirements defined by the eight Project Objectives and the four established Evaluation Criteria (Chapter 2, Sections 2.3.3 and 2.3.4).

The essential differences as compared to the proposed action are highlighted in the following statements.

- Only one of the alternative actions (conventional feedlot alternative) would create a commercial scale dairy operation in Hawai'i, with the capability to produce 10 percent of the State's fresh milk demand thus reducing dependence on imported milk (Objective 1). This alternative, however, would not reduce reliance on costly imported fertilizer and feed (Objective 2); grow local, quality grass as a primary feedstock (Objective 3); and would not utilize 100 percent of manure on site as nutrients to grow forage for dairy cows (Criterion 4).
- None of the alternatives would secure a dairy location that meets the requirements for a pastoral, pasture-based grazing dairy: sufficient contiguous land area; available long-term land tenure; adequate potable water supply; suitable soil properties; gentle slope conditions; and accessibility (Criterion 1).
- One alternative (Agricultural Park) could potentially generate new long-term employment in the agricultural sector on Kaua'i in a wide range of positions including pasture agronomy/soils science, environmental resources management (Criterion 2).
- The Agricultural Park alternative could also develop sustainable food production utilizing Important Agricultural Lands, demonstrating the importance of long-term agricultural leases and capital investment for agricultural infrastructure, water systems and support facilities. (Criterion 3). However, after years of trying, it appears there was limited interest in such a venture.
- Finally, addressing the range of potential environmental impacts (natural, cultural, social and economic) (Objective 8) the two alternative development scenarios would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.

In contrast to the other options considered, the planned agricultural operation of Hawai'i Dairy Farms, was determined to be the most viable option and is the preferred alternative. Of all the alternatives considered, this is the only approach that achieves project objectives and meets each of the four Evaluation Criteria.

- Hawai'i Dairy Farms will create a commercial scale pasture-based dairy operation in Hawai'i, with the capability to provide more than 1,000,000

gallons of the fresh milk demand, reducing dependence on imported milk (Objective 1).
- The planned dairy location meets the requirements of minimum land area, soil properties, slope conditions, water supply, land tenure and availability, and accessibility (Criterion 1).
- The planned action will generate new long-term employment in the agricultural sector on Kaua'i, including pasture agronomy/soils science, veterinary and animal husbandry, environmental resources management, milk/milk processing, and dairy business management (Criterion 2).
- Sustainable food production utilizing Important Agricultural Lands (Criterion 3) will occur with the proposed action, demonstrating the importance of long term agricultural leases, and the ability to draw capital investment for agricultural infrastructure including water systems and support facilities (Criterion 3).
- Address the range of potential environmental impacts by utilizing 100 percent of manure as natural fertilizer to grow the majority of food for cows (Criterion 4). The alternatives evaluated would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.
- Creating an economically viable pasture rotational-grazing model maintains agriculture, retains open space, and provides buffer between highly utilized resort and residential development and sensitive natural or cultural resources (Objective 8).

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

From: Lisa Hartman
To: HDF
Subject: Comments on Hawaii Dairy Farm"s EISPN
Date: Monday, February 23, 2015 12:38:38 PM

Aloha,

I have very serious concerns about the proposed dairy at Mahaulepu Valley on Kauai. I am glad that an EIS will be prepared and hope that it will address the many issues, environmental, social and cultural, that a dairy in this location presents. While HDF states they are voluntarily doing this process, to truly be pono, this should have been done well in advance of any infrastructure changes or the announcement that a dairy IS going in at this location, as the EIS is designed to determine whether a project like a dairy ***should*** go in by providing substantive data that indicates that it will not be environmentally, culturally or socially harmful.

NUMBERS

Beginning with the proposed herd and the recent "reduction" in herd size to 699 (a significantly chosen number as 700 cows is classified as a Large Confined Animal Feed Operation). What is not noted by HDF with this revised herd size is that those 699 cows will be shipped in pregnant, thus there will be double that number after gestation. Males will then be thinned out through outsourcing and killing of a certain amount, so that 699 would be about 900 cows on the land after gestation. Regardless of this claim of a reduced herd size, the EIS must evaluate the plan based on the proposed final herd size of 2,000.

WASTE

According to the EPA, waste estimates for dairy cattle are equivalent to 164 times the amount of humans, thus the 2,000 cows would produce waste equivalent to approximately 328,000 people, fully 5 times the population of the entire island. Microorganisms causing health risks to humans like E. Coli, enterococcus and leptospirosis are common in the feces of cattle, these organisms could likely end up in the adjacent streams leading to the ocean as well as groundwater.

SOIL

HDF should be required to do a detailed, accurate soil survey to determine once and for all if the soil is able to handle the amount of waste that will accumulate and be applied via airborne spray as fertilizer. Again, had HDF followed proper protocol and done an EIS at the outset, perhaps they would have provided more accurate information on the soil in the area in question. Their initial plan stated that soil in the area was porous volcanic, which it is not. A later NRCS survey of the soil indicates that most of it is primarily clay with "very limited" capability to handle manure load and has a high potential for runoff.

DRINKING WATER WELLS

HDF should be required to do an extensive groundwater study to assess effects of waste applied to the soil. Their current Waste Management Plan does not identify all of the nearby drinking water wells and misrepresents the distance of some of those that are identified on the map. Most significantly, one well (Koloa F) is very near to the area in which their wastewater treatment plant will apply the sludge that accumulates in the ponds.

AIRBORNE CONTAMINANTS

HDF plans to spray waste from the effluent ponds on the fields as fertilizer. These spray machines are very tall and with dominant trade winds the possibility of spray affecting homes and businesses downwind is a potential problem. The EIS should address airborne contaminants produced by the dairy and the environmental, health, and social impacts.

SOCIAL CONCERNS

The Mahaulepu area is popular for nature oriented activities and subsistence such as fishing, hiking, beach-going activities, bird watching and more. The EIS must address how these activities would be impacted by environmental effects from a large dairy of this size upstream of the beach-going area.

The Koloa/Poipu area is home to approximately 3,000 residents, all of whom will be downwind of the dairy and thus affected by any airborne contaminants or odor. The area is also one of the top 3 visitor destinations, providing significant income to both County and State through property, TAT, general excise and other taxes. Environmental air, water and vector control concerns from the dairy would reduce property values and make the area less desirable to visitors. The largest private employer for the island is within 2.5 miles of the proposed dairy and a thriving visitor industry encompasses the entire Koloa/Poipu area, a decrease in visitors to the area would adversely affect those employers thus causing loss of jobs and income for island residents. Reduced property values and visitors to the area would not only affect the local economy through loss of jobs/decreased incomes for residents, but reduced revenues for the State and County as well.

The above noted concerns should all be fully addressed by the EIS for Hawaii Dairy Farm's proposal at Mahaulepu Valley. Given the open, available, leasable land on the island, particularly that owned by Lessor Grove Farm, this seems to be one of the most ill-suited locations for such an operation. It's proximity to freshwater sources, the ocean, nearby homes and businesses make this an extremely poor

location for a dairy, especially given that all milk will have to be trucked to the port in Nawiliwili for shipment to Oahu for processing. The above noted environmental, health & social concerns in addition to this fact, render this a plan that will negatively impact the environment and economy of Kauai.

Mahalo for your careful consideration of my concerns and your diligence in evaluating the impacts of this project.

Lisa Hartman

GROUP 70 INTERNATIONAL

May 26, 2016

Lisa Hartman
lisa.hartman009@gmail.com

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Lisa Hartman:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

DAIRY OPERATIONS: Hawai'i Dairy Farms (HDF) will establish and operate a sustainable, pastoral rotational-grazing dairy farm in Māhā'ulepū Valley on the island of Kaua'i to produce fresh, locally available nutritious milk for Hawai'i families. The rotational-grazing method utilizes 100 percent of the cows' manure as natural fertilizer to grow pasture grass as a primary source of nutrition for dairy cows. This cost-effective method will reduce reliance on imported fertilizer and feed. Pasture grass will comprise at least 70 percent of the animals' diet. As a part of the Draft Environmental Impact Statement (EIS), the proposed facilities and operations for the dairy farm are described in Chapter 3.

The Environmental Impact Statement (EIS) Preparation Notice (EISPN), published January 23, 2015, described the proposed pasture-based rotational grazing system as a "zero-discharge, grass-fed dairy". The term "zero-discharge" under the U.S. Environmental Protection Agency related to concentrated feeding operations

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(CAFO) is a system designed to not discharge pollutants into waters of the United States. As noted previously, the HDF system is designed to utilize 100 percent of the cows' manure on-site. However, nutrients would be introduced to the HDF site with any use; the Draft EIS identifies the amount of nutrients anticipated from the proposed dairy operations that could pass through to ground and surface waters. Therefore, HDF elected to discontinue use of the term "zero discharge" as it was construed as no nutrients into the system.

The term "grass-fed" was used in the HDF EISPN. This term was used to identify HDF's intent to utilize a locally-produced feedstock – grass – for more than 70 percent of the dairy herds' diet. In January 2016, the U.S. Department of Agricultural (USDA) Marketing Survey created a narrow legal definition of "grass-fed". The USDA standard defines what animals can and cannot be fed. The Food Alliance, a project of several northwest colleges, believes that when consumers choose grass-fed products there is an expectation that these will come from animals raised on pasture on a forage-based diet. Due to the evolving definition of "grass-fed", the term in not used in this EIS.

The dairy facilities will occupy an area of approximately 10 acres on the western boundary of the site. The developed area "footprint" will be less than 2 percent of the total farm area. Four buildings will be constructed to serve different functions, supported by utilities and infrastructure. Additional building information can be found in Draft EIS Section 3.3.1.

Agricultural infrastructure and utilities required for the dairy operations will include storage tanks and silos, effluent storage ponds, livestock water systems, and drainage improvements. The irrigation system and distribution of livestock water are discussed in Draft EIS Section 3.5, Pasture Management.

The pastoral rotational-grazing dairy provides a local feedstock – grass – as the herd's primary food source. Reducing imported feed stabilizes costs and provides a food source closer to the natural diet of cows. Results of grass trials initially conducted at five sites across four Hawaiian Islands were instrumental in identifying appropriate varieties of grass, and suitable sites to support sufficient "dry matter" grass yields essential to a cow's diet. Additional project-specific trials at the Māhāʻulepū site on Kauai have been conducted for more than 18 months. The results have identified sufficient yield and nutrition to supply 70 percent of the cows' diet; improvements in grass productivity are anticipated to provide up to 85 percent of cows' diet.

The pasture-based model allows cows to move about freely, and to lie down and rest, which is part of the digestion cycle. The animals are managed in social groups known as "mobs", mimicking the natural social order of bovines. Cows spend 22 hours of each 24-hour period foraging on pasture or resting, outdoors in natural light and fresh air. The gently sloped paddocks, walkways and races minimize the energy expended by the mature dairy cows as they graze or are transferred to and from the various paddocks and the mature dairy facility; surfaces of the walkways and cow races are designed to provide a comfortable path under hoof. The management practices and pasture model applied by HDF maximizes grass as the

cows' primary nutrition source and minimizes stress to the animals. Cows tend to be healthier and live longer, productive lives with access to fresh air, high quality feed, and exercise while they forage.

The 470 acres of pasture will be divided into paddocks averaging 3 to 5 acres in size. Smaller paddocks located near the dairy facility will be used as temporary pasture for cows or calves being moved on or off the farm. To protect the water quality of surface water and downstream areas, paddock fences are set back 35 feet from the edge of drainage ways throughout the site. Existing vegetation within the setbacks will be managed or restored to reduce erosion, improve stability of ditch banks, increase net carbon storage, and improve and maintain water quality.

The majority of the pastures will be irrigated with non-potable water and/or diluted effluent through either the pivot irrigation systems or through gun irrigators. Irrigation water supply is provided to the farm from Waita Reservoir, and will be filtered and pumped to the various irrigation components on the farm. The irrigation system is controlled using computer software and GPS receivers to allow very precise application of irrigation and/or diluted effluent on the pasture. The pivots can rotate and apply irrigation water and/or diluted effluent at different rates depending on the actual irrigation needs of the farm.

NRCS provides technical guidance on applying agricultural waste depending on the desired use of the waste. Reflected in the title of the livestock waste guidance for Hawaiʻi is the parenthetical inclusion of the word "nutrients." Where waste is utilized as a resource, it is being used for the constituent components that provide benefit.

The NRCS Conservation Practice Standard 590, Nutrient Management, applies to commercial fertilizers, organic by-products, waste water, organic matter, and irrigation water. Nutrient management is the practice of managing the amount, rate, source, method of application, and timing of plant nutrients and soil amendments. The timing and application of nutrients will correspond with plant uptake, soil properties and weather conditions. For more information on nutrient balance management see Draft EIS Section 3.5.3, and Draft EIS Appendix D.

The effluent storage ponds are sized to accommodate 30 days of storage for up to 2,000 mature dairy cows, and over 85 days of storage for 699 mature dairy cows. It will be highly unlikely that the storage pond will be full at any time for the contemplated 2,000-cow dairy, and nearly impossible for the committed 699-cow dairy. Throughout the less than 30-day storage period, effluent is planned for application every four days, and the slurry application is expected at least once every 45 days, to ensure that the ponds are kept at manageable levels.

Cows lactate milk following the birth of calves. Newborn calves will be housed on the Māhāʻulepū site and provided essential colostrum and nutrients for a healthy start. During the calves' initial 90 days, they will be transitioned to pasture at HDF before transfer to ranches on Kauaʻi to be raised off-site. The committed herd size of 699 mature dairy cows at the Māhāʻulepū site applies to mature mature dairy cows. Animals in various stages of lactation and rest will be transferred between HDF and

other partner ranches as needed for animal health and dairy productivity. This will benefit both the dairy and infuse the beef market in Hawai'i with a new, local source of pasture-raised calves. Male calves will become part of the beef cattle herd; heifers (young female calves that haven't given birth) will be raised until ready to return to the HDF herd as a birthing/mature dairy cow. For more information on off-site herd management, refer to Section 3.7 of the Draft EIS.

Health of the herd is of primary importance as the success of a dairy relies on cows effectively producing quality milk. All cows will be treated with a high standard of care. Dairy managers and caretakers will be trained and competent in handling animals to minimize stress and ensure the herds' welfare. A licensed veterinarian may prescribe use of antibiotics approved by the Food & Drug Administration (FDA) for treatment of illnesses. Adherence to guidelines that prohibit milk from cows undergoing antibiotic treatment will ensure no adulteration of milk. Routine laboratory tests of milk for traces of antibiotic residue will be conducted. HDF will not inject cows with bovine growth hormone, referred to as rBST or rBGH.

SOILS: Soil is an ecosystem that can be managed to provide nutrients for plant growth, to absorb and hold rainwater for use during dryer periods, to filter and buffer potential pollutants from leaving fields, to serve as a firm foundation for agricultural activities, and to provide habitat for soil microbes to flourish and diversify to keep the ecosystem healthy. Two rounds of independent soil sampling were undertaken at HDF to understand and characterize available soil nutrients and conditions. Section 4.3 of the Environmental Impact Statement (EIS) characterizes soil conditions, and anticipated impacts from effluent and supplemental nutrient application. Recommendations from Dr. Russell Yost and Nicholas Krueger of the University of Hawai'i at Mānoa are summarized. Their baseline nutrient report is included as Appendix C of the Draft EIS.

Soil conservation is a core principal behind establishment of the NRCS, which was formed out of the Soil Conservation Service to acknowledge its expanded role in watershed-scale approach using science-based tools and standards in agronomy, engineering economics, wildlife biology and other disciplines to aid landowners in implementation of conservation practices. NRCS conservation practices are listed in Chapter 3, Section 3.2; these practices codes identify design and construction standards related to drainage, materials, operations and applicable engineering standards. HDF will follow the developed Conservation Plan, which was approved by the West Kaua'i Soil & Water Conservation District in December, 2013.

The United States Department of Agriculture (USDA) Natural Resources Conservation Services (NRCS) has mapped and classified soils for more than 95 percent of the United States. Comments received during the initial scoping for this EIS included a "Custom Soils Resource Report for Island of Kaua'i, Hawai'i." The report was generated from the USDA NRCS website, which allows any internet user to define an area of interest, customize data results, and generate a Custom Soil Resource Report. The user can select or deselect parameters based upon which data the user would like to display. These user-generated reports are not evaluated by NRCS.

The NRCS soils classifications and descriptions provide a good information base, however, in-field soils testing is needed to identify existing soil nutrient levels and conditions. The most abundant soil types at the HDF site are Kalihi Clay at 32 percent, Ka'ena Clay Brown Variant at 29 percent, and Lualualei Clay at roughly 14 percent of the dairy site. Laboratory analysis of soil samples collected in 2014 identified levels of pH, phosphorus, nitrogen, potassium, calcium, magnesium, organic matter, salinity, micronutrients and other constituents. The results illustrate that the soils are depleted of nutrients, which is typical for lands formerly used for sugarcane. The soil nutrient status and fertility demands of the primary crop, Kikuyu grass, were used to identify the quantities of nutrients required for productive grass growth. The soils data provide a baseline to guide adaptive nutrient management throughout establishment and maturity of the dairy.

A second round of field sampling was conducted in 2015, and focused on evaluation of soils characterized as "poorly drained", and established a quantitative baseline of soil salinity and sodicity to provide for future monitoring of soil health with application of manure effluent. Laboratory analysis determined electrical conductivity and exchangeable sodium percentage, in addition to nutrient levels of nitrogen phosphorus calcium, magnesium, and potassium.

Poorly drained is not an indication of low or poor infiltration. Infiltration refers to the ability of water to enter the soil surface, whereas "drainage" refers to the movement of water within or from the soil profile. Poorly drained soils typically have low hydraulic conductivity, or a slow rate of groundwater movement through the soil. This slow movement can create anaerobic conditions, which typically result in higher rates of denitrification. This is the conversion of potentially nitrates and nitrites to gaseous forms, which reduces the potential for impacts on waterbodies. In this way, "poorly drained" soils may represent less risk of nitrate and nitrite leaching to associated waterbodies than "well drained" soils (Yost, 2016).

As a result of reduced movement of water through the soil profile, the mobility of nutrients such as potassium and phosphorus is also reduced. Soil types at the HDF site are known to adsorb and retain large amounts of phosphorus. Under the NRCS phosphorus leaching index for Hawai'i soils, HDF soils show low risk for leaching. With low risk, phosphorus can be applied at rates greater than crop requirements if manure or other organic materials are used to supply nutrients.

The dairy's focus on robust and healthy grass growth will build organic matter in soils through use of manure as a natural fertilizer. Soil can incorporate carbon from the atmosphere, which benefits soil health. According to recent studies in the Soil Science Society of America Journal, the conversion of formerly tilled cropland to grazed pasture can drive substantial accumulation of organic carbons in soil, with a potential to offset up to one-third of the annual increase in atmospheric carbon dioxide. The potential soil organic matter and carbon dioxide sequestration benefits are likely greatest in highly degraded soils in warm subtropical climates, partly due to long pasture-growing seasons. Long-term soil impacts are anticipated to result in improvement to the physical, chemical, and biological condition of the soil.

ARCHAEOLOGICAL AND CULTURAL: The Hawai'i Dairy Farms (HDF) project is subject to a historic preservation review by the State Department of Land and Natural Resources, State Historic Preservation Division (SHPD) under HRS Chapter 6E and Chapter 13-284. An Archaeological Inventory Survey (AIS) and a Cultural Impact Assessment (CIA) were conducted by Scientific Consultant Services (SCS) for the proposed project. EIS Sections 4.7 and 4.8 provide an evaluation of archaeology and cultural resources, with technical studies in Appendix G and H.

A total of sixteen historic properties were identified through a pedestrian survey of the project area and an extended survey area of 100 meters of the northern boundary. Six historic-era sites occur in the project area and 10 sites occur in the extended survey area. Only one of the sites is believed to be associated with pre-Contact and/or early historic times. State Site 50-30-10-2250, the agricultural heiau, and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area. The remaining sites consist of historic-era bridges, ditches, culverts, retaining walls, and a flume system dating from the 20th century and are affiliated with sugarcane cultivation.

That a majority of the documented sites are related to the historic-era is not surprising, given the massive landscape modifications that occurred during intensive sugarcane cultivation on the valley floor. Even historic era cultural materials associated with the many Land Commission Awards in the project area were non-existent, as explored through survey and subsurface exploration.

The sixteen historic properties have been assessed for significance by the archaeological consultant and the dairy project is anticipated to have no impact on these sites. No further archaeological work is recommended for the sites. Two of the sixteen sites are considered significant under multiple criteria, but occur outside the project area on lands owned by a different landowner. Both sites will not be adversely affected by the proposed dairy project. No site is related to burials, and no bonex were found. Such sites have been reported along coastal areas in sand dunes.

The cultural assessment examined the potential effect of the project on cultural resources, practices or beliefs, its potential to isolate cultural resources, practices or beliefs from their setting, and the potential of the project to introduce elements which may alter the setting in which cultural practices take place. Information received from the community indicates the Māhā'ulepū Ahupua'a, has been and is currently used for traditional cultural purposes. However, the dairy project area has not been included in these activities. It is clear that the gathered plants, trails, State Site 50-30-10-2250, the agricultural heiau, and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area.

The project will be fully enclosed by perimeter fencing along the boundary of the leased premises, which will ensure that project activities and any related impacts are contained within the project area. Based on the research and comments received from the community, it is reasonable to conclude that, pursuant to Act 50, the exercise of native Hawaiian rights or any ethnic group related to numerous traditional cultural practices will not be impacted by establishment of the dairy.

DEMOGRAPHIC AND ECONOMIC: The potential impacts of Hawai'i Dairy Farms (HDF) to the existing economy were evaluated in the Draft Environmental Impact Statement (EIS), including a fiscal impact assessment report completed in April, 2016 by Plasch Economics Pacific. Draft EIS Section 4.15 addresses demographic and economic factors, with the complete report in Appendix J.

The HDF project would create short-term benefits through jobs for local construction personnel and local material suppliers. Such jobs would include equipment operators, cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, supervisors, painters, etc. Based on State employment multipliers, indirect employment related to Dairy construction would be expected to average about 16 jobs on Kaua'i, and 8 on O'ahu. Construction employment would be expected to average about 12 jobs per year during the development period. Thus direct-plus-indirect employment association with construction would be expected to average approximately 36 jobs, of which 28 would be on Kaua'i.

The HDF project would contribute to diversification of Kaua'i's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Hawai'i Island), approximately10 percent of Hawai'i's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and indirect full-time equivalent jobs on Kaua'i, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on O'ahu.

HDF is expected to generate a net income of approximately $68,000 to the County when the 699 cow herd is established. When the dairy has matured to full production for the 699 cow dairy, net income to the State is calculated at $160,000 annually. With the potential contemplated herd size of up to 2,000 mature dairy cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be produced. This would double local milk production currently supplied by operational dairies on the Island of Hawai'i.

Additional employment generated by a possible expansion to accommodate the contemplated 2,000 mature dairy cow herd is estimated at approximately 3 construction jobs plus 4 indirect jobs on Kaua'i, and 2 indirect jobs on O'ahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an additional 5 full-time farm jobs would be added, with approximately 15 additional indirect jobs on Kaua'i and another 8 indirect jobs on O'ahu.

The dairy is expected to generate a net additional contribution to the County of approximately $8,000 for improvements related to expansion for the contemplated herd size of up to 2,000 mature dairy cows ($76,000 total versus $68,000 for the committed herd size). The State will derive approximately $360,000 annually in revenues from the contemplated 2,000-mature dairy cow dairy.

Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhā'ulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhā'ulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Po'ipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhā'ulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered

volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawai'i Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhā'ulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhā'ulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhā'ulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kaua'i community.

Regional Water Demand: The adjacent, developed Kōloa-Po'ipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kaua'i will increase county-wide by 17,300 residents by 2030. The South Kaua'i population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kaua'i region (the Kōloa - Po'ipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well

water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhāʻulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhāʻulepū watershed.

The HDF site is located on the bottom-land of the upper Māhāʻulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Haʻupu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhāʻulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kauaʻi Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhāʻulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhāʻulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs

from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhāʻulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Poʻipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kauaʻi community.

AIR QUALITY: As a part of the Environmental Impact Statement (EIS), existing air quality conditions and project impacts were evaluated, including dust and odor. Potential odors and emission levels for air pollutants relevant to dairy operations

were modeled, as currently there are no cows on site. EIS sections 4.19 and 4.25 provide an evaluation of air quality and odors, including a windrose depicting wind speed and direction in the area (see DEIS Section 4.1, Climate). The full air quality technical report can be found in Draft EIS Appendix I.

Clean Air Act

Under the *Clean Air Act of 1970* (CAA), amended November 1990, the U.S. Environmental Protection Agency (EPA) regulates both large and small sources of air pollutants by establishing National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. The State of Hawaiʻi has established its own *State Ambient Air Quality Standards* (SAAQS) that are as strict or, in some cases more strict than the NAAQS. State standards prohibit any visible emissions of fugitive dust from construction activities at the property line.

Emissions relevant to livestock operation include particulate matter and fugitive dust. Greenhouse gases related to dairy cows include methane (CH_4) from enteric fermentation, and both methane and nitrous oxide (N_20) emissions from manure application. No State or Federal regulations for greenhouse gas emissions from farm operations or small businesses currently exist.

DUST

Dust will be generated as cows move along soft limestone walkways that connect the paddocks and lead to and from the milking parlor. Potential fugitive dust emission rates were estimated from published literature, where particulate matter (PM) is measurable from the "drylots" of confined dairy operations where animals walk over dirt and dried manure throughout the day.

Applying the emission rates from this available literature greatly overestimates potential emission resulting from HDF. Cows in the pastoral rotational-grazing system will be on pasture 22 hours each day and will spend two hours – in two separate milking cycles –moving to and from the barn for the 10- to 15-minute milking sessions.

Using atmospheric dispersion modeling system (AERMOD), the rates were scaled to the size of the non-pasture areas used by cows at HDF. Results were added to the background concentration of particulate matter (both PM_{10} and $PM_{2.5}$) measured on the island of Kauaʻi, and the total concentration was compared to the State ambient air quality standards. Only the contemplated herd size of up to 2,000 mature dairy cows was modeled, as at the lower threshold of 699 cows, the potential fugitive dust impact would be negligible. The estimated concentration for PM_{10} is 2.01 $\mu g/m^3$, well below the State standard of 150 $\mu g/m^3$. The estimated concentration for $PM_{2.5}$ is 0.23 $\mu g/m^3$, well below the Federal standard of 35 $\mu g/m^3$ (see Draft EIS Section 4.19 and Table 4-19.2).

ODOR

Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area

leased by HDF, so air dispersion models were used to determine potential odor levels. Local weather data was used in conjunction with the AERMOD modeling system, and published rates for manure odors emissions for dairy heifers and effluent ponds were adapted to reflect the HDF facilities.

Odor emission sources identified for modeling at HDF were manure in the pasture fields, irrigation water containing diluted nutrients from effluent, the effluent storage ponds, and the dairy buildings. Odor rates from published research were applied. Odor isopleths (a line used to map all points having the same numerical value) were created to display the model findings. Odor is described in "odor units" at the threshold of perception, which is defined by the point at which 50 percent of panelists, in laboratory conditions, cannot smell the odor but 50 percent of the panelists can detect the odor.

Modeling results were generated for worst case meteorological conditions (low wind velocity / mixing). Generally, tradewinds will disperse odors to less than detectable levels beyond the HDF site; in periods of no wind, odor may not be dispersed creating the "worst case" scenario. In these periods without normal tradewind flow, the odor plume would extend to the south of the HDF site. Sections 4.19.2 and 4.25.2 of the EIS include graphics of the potential odor isopleths.

Results for the committed herd size of 699 mature dairy cows show that odors may be detectable by 50 percent of the sensitive population once per 200 hours, or 44 hours per year, within an area that extends approximately 1,670-feet (within one-third of a mile) beyond the dairy farm boundary, and does not reach recreational or residential areas. Results for the contemplated expanded herd size of up to 2,000 mature dairy cows show odors would not extend beyond 2,780 feet outside the HDF boundary (just over half a mile), again not reaching recreational or residential areas, and again with detection limited to 50 percent of the sensitive population approximately 44 hours per year. The parameters used in the analysis were intentionally conservative, and the impacts shown assume an unlikely confluence of worst-case meteorological data, irrigation location, and grazing location. Actual offsite odor impacts are likely to be much lower and/or less frequent than shown; it is likely odor detection beyond the HDF boundaries will be less frequent.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

From: HDF <hdf@group70int.com>
Sent: Wednesday, February 11, 2015 2:50 PM
To:
Subject: RE: Hawaii Dairy Farms Comments

Thank you for conveying the message.

Group 70 International
Consultant to Hawaii Dairy Farms

From: [mailto: @doh.hawaii.gov]
Sent: Wednesday, February 11, 2015 8:56 AM
To: HDF
Subject: Hawaii Dairy Farms Comments

Received a verbal comment from Alfred P. Havas from Arizona who owns property in Koloa, parcel #901. If you want to check with the GM of Poipu Kai, Carolyn, you can verify that he is a property owner. He is disabled and bought into this luxury area, where he feels a dairy doesn't belong here, maybe somewhere else.

Secretary, Environmental Planning Office
Hawaii State Department of Health
919 Ala Moana Blvd., Rm. 312
Honolulu, Hawaii 96814
Phone: (808) 586-
Email: @doh.hawaii.gov
Website: http://health.hawaii.gov/epo

GROUP 70 INTERNATIONAL

May 26, 2016

Alfred P. Havas

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Alfred P. Havas:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

Your comments were received by the State of Hawai'i Department of Health Environmental Planning office. The Department of Health forwarded a copy of your comments to Group 70 International in order to be included in the Draft Environmental Impact Statement (EIS) analysis. This letter was prepared in response to your comments.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

LAND USE: The historical and existing land uses of the project site and surrounding Māhā'ulepū Valley were examined in the Draft Environmental Impact Statement (EIS), and uses proposed by the Hawai'i Dairy Farms (HDF) project were evaluated in the context of county and state land use designations for the area. The evaluation of land use is presented in Draft EIS Chapter 4.4, and the project's consistency with government plans and policies is presented in Draft EIS Chapter 5.0.

The south shore of Kaua'i is home to some of the most productive farm land in the state, attributed to consistent sunshine, ample fresh water, and a large amount of Class A and B soils (with "A" representing the class of highest productivity soils and "E" representing the lowest). The large tracts of farmland, including those of Mahaulepu Farm and Grove Farm, allow for stability in support of farm ventures, help maintain regional water systems and provide agricultural employment for Kaua'i residents in addition to fresh, local food.

The project site is on agricultural land in Māhā'ulepū Valley, an area with a long history of agricultural use as it was the first place in the island chain where sugarcane was commercially grown. The site is in the Agricultural District per State Land Use District designations, and per the County of Kaua'i zoning ordinance. The site consists of land classified as Prime per the State Department of Agriculture's Agricultural Lands of Importance to the State of Hawai'i (ALISH). The HDF site is outside of the County-designated Special Management Area under the Coastal Zone Management Program.

In 2005, the State established Important Agricultural Lands (IAL) by statute. The purpose of IAL is to conserve and protect agricultural lands, promote diversified agriculture, increase agricultural self-sufficiency and assure the availability of agriculturally suitable lands. The designation process determines land meet physical requirements including contiguous, functional land units large enough to allow flexibility in agricultural production near appropriate infrastructure and water, with high quality soil agricultural productivity ratings under the Land Study Bureau of University of Hawai'i.

In 2011, Mahaulepu Farm LLC filed a petition with the State of Hawai'i Land Use Commission to designate 1,533 acres of agricultural lands in Māhā'ulepū (including 557 acres that make up the HDF site) as IAL. IAL designation meets the objectives of the State HRS §205-42 by contributing to the maintenance of a strategic agricultural land resource base to support a diversity of agricultural activities and opportunities that expand agricultural income and job opportunities. See Figure 4.4-2 in DEIS Section 4.4.

The designation process determined that the land meets a number of physical requirements established in HRS §205-45, including contiguous, functional land units large enough to allow flexibility in agricultural production near appropriate infrastructure and water, with 88.5 percent of the area featuring an overall soil agricultural productivity rating of "B" per criteria established by the Land Study Bureau of University of Hawai'i.

The development and long-term operation of HDF will be in full compliance with its agricultural State Land Use District designation, ALISH classifications, and County zoning. The dairy farm will embody the intent of the IAL designation per the Hawai'i State Constitution, by using these protected lands for the intended purpose of diversified agriculture, food production and agricultural self-sufficiency. HDF development of a dairy also supports the "secondary intent" for lands in the Agriculture land designation, to provide an opportunity for Kaua'i citizens to reside

in an agricultural community. This is in contrast to the described "agricultural subdivisions" that have changed parts of Kaua'i intended for a rural landscape, with development as quasi-suburban landscapes dotted with residences on large lots.

Overall, the project provides long-term benefit and support of agricultural lands and industry through continued use in keeping with zoning and IAL designation. Long-term operation of the dairy does not preclude the region for future protection in a coastal park at Māhā'ulepū.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

RECEIVED

FEB 23 2015

GROUP 70 INTL

19 February 2015

To: Ms. Laura McIntyre, Environmental Planning Office, Hawaii Dept. of Health, 1250 Punchbowl Street, Honolulu, HI 96813
cc. Group 70 International, Inc., 925 Bethel Street, 5th Floor,
Hawaii Dairy Farms, LLC
From: Donald E. Heacock, Aquatic Biologist

Hawaii Dairy Farms (HDF) proposes to establish and operate the first zero-discharge dairy in Hawaii using sustainable farming methods on 578 acres of land in Maha'ulepu, Kauai.

General Comments:
The HDF, as planned, is extremely unlikely to establish a zero-discharge dairy at this site in Maha'ulepu, Kauai, for the following reasons:

- Lack of appurtenant water rights,
- located primarily (65%) on soils classified as "hard clay, impervious to water",
- Located adjacent to streams and Class A marine waters along the Mahaulepu coastline that is classified as Class 1 critical habitat for Hawaiian monk seals, seabirds and green sea turtles that live there,
- Receiving waters that are already polluted (with indicator bacteria and Nitrogen/Nitrate) as compared to Hawaii's Water Quality Standards,
- No mitigation plan: if something goes wrong, like thousands of gallons of manure/urine discharged into the ocean, the cumulative and negative impacts on public trust resources (like coral reefs), which may never recover;

Specific Comments/Recommendations:

1) **Lack of Appurtenant Water Rights**
The proposed HDF is dependent upon Grove Farm supplying them with irrigation water from Waita Reservoir; Waita Reservoir is dependent upon water diverted from the Huleia River by Grove Farm. However, neither HDF nor Grove Farm have appurtenant water rights to water from the Huleia River. The water now being diverted from the Huleia River to fill Waita Reservoir results in the complete dewatering of the river (i.e., dry river bed below the diversion for 100-200 yards downstream), which blocks the migration of native Hawaiian stream animals which need to migrate upstream to their adult habitat, and downstream to spawn; 90% of native Hawaiian stream animals ('o'opu, 'opae and hihiwai) are endemic , found nowhere else on Earth; furthermore, this severe dewatering of the Huleia River and its negative biological impacts, it is in violation of the Federal Clean Water Act (which requires the protection of the biological integrity of water bodies) and is contrary to the Hawaii State Water Code which is to protect the beneficial instream uses (such as production of fish and wildlife, swimming, aesthetic enjoyment).

Also a local group of native Hawaiians, taro farmers and Kuleana land owners have formed "Hui Ho'opulapula Na Wai o Puna" (lit. the people who want to restore the waters of Puna) to restore the instream flows of the Huleia, Hanamaulu, Wailua and other rivers and streams in the Puna District. The Hui is working with Earth Justice and will petition the State Commission on Water Resources Management (CWRM) to establish the Hanamaulu Aquifer (which includes the Huleia River to the South fork of the Wailua River) as a "Ground and Surface Water Management Area") and to restore instream flows to the streams and rivers within the Hanamaulu Aquifer. Because of presidents set in previous Hawaii Supreme Court Decisions and Orders (Waiahole, 2000 and Na Wai Eha (2014), the outcome of the Hui's petition to CWRM can legally be determined.
Recommendation: Therefore, the EIS should include specific data/documentation establishing Grove Farm's and HDF's having appurtenant water rights to the water of the Huleia River for public trust beneficial uses.

2) **Coastal Receiving Waters Already Polluted**
Currently, according to water quality monitoring data collected by Dr. Carl Berg, Surfrider Foundation, Kauai Chapter, the nearby receiving waters are polluted far beyond the Hawaii Water Quality Standards with indicator bacteria and with nitrogen/nitrate. Therefore, any polluted storm water runoff from the proposed HDF site will further and cumulatively negatively impact coastal water quality, the coral reef ecosystem, and other public trust natural resources.

Because the recently conducted USDA/NRCS [1]detailed soil analysis of the HDF site, showing that the dairy site is composed primarily (65%) of hard clay soils impervious to water (which HDF neglected to cite/mention in their Farm Conservation Plan), it will be virtually impossible to prevent polluted runoff from the HDF site with such high cow stocking rates during periods of heavy rains. These discharges will cumulatively add to coastal eutrophication, coral reef degradation and to losses of public trust natural resources.
Recommendation: Therefore, with these points in mind, and based upon the Precautionary Principle, no NPDES permits should be issued until the existing water pollution in the area is cleaned up, and additionally, until HDF shows conclusively that they can prevent storm water discharges containing pollutants from the dairy.

Sincerely,
Donald E. Heacock
Donald E. Heacock, Aquatic Biologist

[1] USDA/NRCS. 2014. Custom Soil Resource Report for Maha'ulepu, Kauai. Pp. 1-78

May 26, 2016

Donald E. Heacock
P.O. Box 1323
Lihue, HI 96766

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Donald E. Heacock:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

HAWAI'I STATE WATER QUALITY CLASSIFICATION AND WATER RIGHTS: Water quality maps available on the Hawai'i State Department of Health website with a date of June 2014 and labeled "Draft" do not reflect the current Hawai'i Administrative Rules (HAR) §11-54, Water Quality Standards. Per §11-54-5.1 Inland water areas to be protected, and §11-54-6 Uses and specific criteria applicable to marine waters, all waters to be protected are listed in Appendices A, B, and C (dated July 1, 2014) of the HAR. No inland waters in the Māhā'ulepū watershed are included in the HAR §11-54 Appendix A. Therefore, no Class 1 Inland Waters exist in or around the HDF site. Marine waters downgradient from the HDF site fall into open coastal waters Class A, as no embayments, marine waters, or open coastal waters in the area are included in the appendices of HAR §11-54 for special protection.

HDF's right to use water from Waita Reservoir for irrigation and other purposes derives from Grove Farm. Grove Farm has advised HDF of its authorization from the Commission on Water Resource Management to divert the water that flows into the Waita Reservoir, and therefore does not need to have appurtenant rights to use surface water.

SOILS: Soil is an ecosystem that can be managed to provide nutrients for plant growth, to absorb and hold rainwater for use during dryer periods, to filter and buffer potential pollutants from leaving fields, to serve as a firm foundation for agricultural activities, and to provide habitat for soil microbes to flourish and diversify to keep the ecosystem healthy. Two rounds of independent soil sampling were undertaken at HDF to understand and characterize available soil nutrients and conditions. Section 4.3 of the Environmental Impact Statement (EIS) characterizes soil conditions, and anticipated impacts from effluent and supplemental nutrient application. Recommendations from Dr. Russell Yost and Nicholas Krueger of the University of Hawai'i at Mānoa are summarized. Their baseline nutrient report is included as Appendix C of the Draft EIS.

Soil conservation is a core principal behind establishment of the NRCS, which was formed out of the Soil Conservation Service to acknowledge its expanded role in watershed-scale approach using science-based tools and standards in agronomy, engineering economics, wildlife biology and other disciplines to aid landowners in implementation of conservation practices. NRCS conservation practices are listed in Chapter 3, Section 3.2; these practices codes identify design and construction standards related to drainage, materials, operations and applicable engineering standards. HDF will follow the developed Conservation Plan, which was approved by the West Kaua'i Soil & Water Conservation District in December, 2013.

The United States Department of Agriculture (USDA) Natural Resources Conservation Services (NRCS) has mapped and classified soils for more than 95 percent of the United States. Comments received during the initial scoping for this EIS included a "Custom Soils Resource Report for Island of Kaua'i, Hawai'i." The report was generated from the USDA NRCS website, which allows any internet user to define an area of interest, customize data results, and generate a Custom Soil Resource Report. The user can select or deselect parameters based upon which data the user would like to display. These user-generated reports are not evaluated by NRCS.

The NRCS soils classifications and descriptions provide a good information base, however, in-field soils testing is needed to identify existing soil nutrient levels and conditions. The most abundant soil types at the HDF site are Kalihi Clay at 32 percent, Ka'ena Clay Brown Variant at 29 percent, and Lualualei Clay at roughly 14 percent of the dairy site. Laboratory analysis of soil samples collected in 2014 identified levels of pH, phosphorus, nitrogen, potassium, calcium, magnesium, organic matter, salinity, micronutrients and other constituents. The results illustrate that the soils are depleted of nutrients, which is typical for lands formerly used for sugarcane. The soil nutrient status and fertility demands of the primary crop, Kikuyu

grass, were used to identify the quantities of nutrients required for productive grass growth. The soils data provide a baseline to guide adaptive nutrient management throughout establishment and maturity of the dairy.

A second round of field sampling was conducted in 2015, and focused on evaluation of soils characterized as "poorly drained", and established a quantitative baseline of soil salinity and sodicity to provide for future monitoring of soil health with application of manure effluent. Laboratory analysis determined electrical conductivity and exchangeable sodium percentage, in addition to nutrient levels of nitrogen phosphorus calcium, magnesium, and potassium.

Poorly drained is not an indication of low or poor infiltration. Infiltration refers to the ability of water to enter the soil surface, whereas "drainage" refers to the movement of water within or from the soil profile. Poorly drained soils typically have low hydraulic conductivity, or a slow rate of groundwater movement through the soil. This slow movement can create anaerobic conditions, which typically result in higher rates of denitrification. This is the conversion of potentially nitrates and nitrites to gaseous forms, which reduces the potential for impacts on waterbodies. In this way, "poorly drained" soils may represent less risk of nitrate and nitrite leaching to associated waterbodies than "well drained" soils (Yost, 2016).

As a result of reduced movement of water through the soil profile, the mobility of nutrients such as potassium and phosphorus is also reduced. Soil types at the HDF site are known to adsorb and retain large amounts of phosphorus. Under the NRCS phosphorus leaching index for Hawai'i soils, HDF soils show low risk for leaching. With low risk, phosphorus can be applied at rates greater than crop requirements if manure or other organic materials are used to supply nutrients.

The dairy's focus on robust and healthy grass growth will build organic matter in soils through use of manure as a natural fertilizer. Soil can incorporate carbon from the atmosphere, which benefits soil health. According to recent studies in the Soil Science Society of America Journal, the conversion of formerly tilled cropland to grazed pasture can drive substantial accumulation of organic carbons in soil, with a potential to offset up to one-third of the annual increase in atmospheric carbon dioxide. The potential soil organic matter and carbon dioxide sequestration benefits are likely greatest in highly degraded soils in warm subtropical climates, partly due to long pasture-growing seasons. Long-term soil impacts are anticipated to result in improvement to the physical, chemical, and biological condition of the soil.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhā'ulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhā'ulepū watershed.

The HDF site is located on the bottom-land of the upper Māhā'ulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Ha'upu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhā'ulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Surface Water Quality: The Kaua'i Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhā'ulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhā'ulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhā'ulepū Valley. The dense canopy along the makai end of Waiopili Ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhā'ulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Poʻipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

MITIGATION

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that

could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kauaʻi community.

The potential for environmental accidents at the dairy farm will be minimal. Reviews and approvals are required from the State Department of Health for the waste management facilities. Standards and regulatory requirements must be met, and capacity beyond the required volumes has been added to provide additional backup storage. A secondary containment system has been designed as an additional safeguard. Risks to surface water quality are minimized with application of best management practices including vegetated buffer zones and 35-foot setbacks to exclude cows from farm drainageways. Effluent irrigation will not occur within 50 feet of agricultural ditches on the farm. Fuels and chemicals utilized at the dairy facilities will be used and stored following established rules and protocols.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawaiʻi Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

Fw: Maha'ulepu valley
From: chrishealy
Sent: Mon, Feb 23, 2015 at 1:37 pm
To: kbs@lauhala.com

RECEIVED
FEB 25 2015
GROUP 70 INTL

Sent via BlackBerry from T-Mobile

-----Original Message-----
From: "chrishealy" <chrishealy@tmo.blackberry.net>
Date: Mon, 23 Feb 2015 20:55:15
To: Chris aol address<chrisahealy1227@aol.com>; <ms.@laura.mcintyre>;
<.state.of.hawaii>; <.dept..of.health>; <.1250.punchbowl.st.>; <.honolulu>; <.hi.96813>;
<group@70.int..inc.>; <.925.bethel.st..5th.fl.>; <.honolulu>; <.hi.96813>;
<mr.@jeff.overton>; <.hawaii.dairy.farms>; <llc>; <.po.box.1690>; <.koloa>;
<.hi.96756-1690>
Reply-To: chrishealy@tmo.blackberry.net
Cc: Healy<jhoopssr@aol.com>
Subject: Maha'ulepu valley

Dear ms. Mcintyre,

As a resident of the poipu area of kauai, I have been keeping abreast of the status of the dairy farm proposed for maha'ulepu valley. My understanding is that an environmental impact study will be prepared.

Giving the controversial nature of the impact of the dairy on the residents in nearby communities, it would appear to me that having that effort lead by group 70 would be a serious conflict of interest. In this case we are basically asking the fox to tell us about the hen house. Without a clearly independent eis the controversy will be more pronounced should the results favor the building of the dairy.

The governmental agencies should require that the people who prepare the eis statement not favor one side or the other.

There are many simple ways to assure the independence of the process. Let the developers pick an expert, and those in the community who object to the location pick an expert. Those two people can then pick a professional who is truly independent.

The resulting eis statement would then have the support of both constituencies, or at worst the independence of the statement would not be called into question.

Very truly yours,
John t. Healy

Sent via BlackBerry from T-Mobile

GROUP 70
INTERNATIONAL

May 26, 2016

John T. Healy
1565 Pele Road
Koloa, HI 96756
chrishealy@tmo.blackberry.net

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear John T. Healy:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

GROUP 70 OBJECTIVITY: Group 70 International, Inc. (Group 70) is responsible for the preparation and processing of the Hawai'i Dairy Farms Environmental Impact Statement (EIS). The EIS was prepared in accordance with the requirements of Chapter 343 Hawai'i Revised Statutes and the "Environmental Impact Statement Rules" (Chapter 200 of Title 11, Hawai'i Administrative Rules). The environmental planning team at Group 70 has prepared several hundred Environmental Assessment and EIS documents over the past 40 years, and every document has been accepted by the responsible County, State and Federal agency. On numerous past EIS projects, the Hawai'i Chapter of the American Planning Association has recognized Group 70's professional work with Chapter awards for excellence in environmental planning. Part of the EIS scoping process involves Group 70's

experienced team of technical sub consultants that are well-known and qualified in their respective fields of study. For this project, Group 70 is preparing the Hawai'i Dairy Farms EIS with the level of analysis required to properly evaluate and disclose the existing environmental conditions, probable impacts with mitigation, and potential cumulative and secondary effects.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

RECEIVED
FEB 23 2015
GROUP 70 INTL

Hawai'i Dairy Farms
MAHA'ULEPU, KAUA'I

ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE

An Environmental Impact Statement (EIS) is being prepared voluntarily by the Applicant to assess potential environmental impacts and mitigation measures associated with agricultural operations at Hawai'i Dairy Farms (HDF) at Māhā'ulepū, Kaua'i.

To assist in preparing the EIS, an Environmental Impact Statement Preparation Notice (EISPN) was recently published. A 30-day public comment period on the EISPN ends February 23, 2015. The purposes of the publication and comment period are two-fold:

1. to allow individuals and groups to request to become a consulted party; and
2. to provide written comment regarding effects of the proposed action.

NOTE: Submitted comments will be published in the Draft EIS

COMMENT

Name: Stephen Hee Organization:

Preferred contact Method
Email: hee8501@comcast.net Postal Address: 2735 Nokekula Cir Lihue HI 96766
Phone: (Optional)

Comments: I am opposed to the establishment of a large dairy farm in the Koloa / Poipu / mahalepu locale. Though I am an avid supporter of agriculture I believe the siting of a dairy in this area is inappropriate
> The risk of environmental pollution is too great regardless of the "technical advancements" in dairy farming
> Such a project is incompatible with the cultural and archeological heritage of the site
> Large concentration of dairy cows will bring flies requiring residents to use pesticides for control.
> Trade winds bring stench to the residential & resort areas
> In spite of all the manure and nitrate problems the dairy still proposes to use inorganic fertilizers for "sustainability"?
I think this is a good project but aimed at the wrong site! A more appropriate area would be the former mauka cane lands of Kekaha Sugar - leased from the State - now idle.

Regards
Stephen Hee
2/21/15

Return to:
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Attn: HDF Project
Honolulu, HI 96813
hdf@group70int.com

And/or:
Hawaii State Department of Health
Environmental Planning Office
919 Ala Moana Boulevard, Rm. 312
Honolulu, HI 96814
epo@doh.hawaii.gov

Deadline: February 23, 2015

May 26, 2016

Stephen Hee
2735 Nokekula Circle
Lihue, HI 96766
hee8501@comcast.net

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Stephen Hee:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

ARCHAEOLOGICAL AND CULTURAL: The Hawai'i Dairy Farms (HDF) project is subject to a historic preservation review by the State Department of Land and Natural Resources, State Historic Preservation Division (SHPD) under HRS Chapter 6E and Chapter 13-284. An Archaeological Inventory Survey (AIS) and a Cultural Impact Assessment (CIA) were conducted by Scientific Consultant Services (SCS) for the proposed project. EIS Sections 4.7 and 4.8 provide an evaluation of archaeology and cultural resources, with technical studies in Appendix G and H.

A total of sixteen historic properties were identified through a pedestrian survey of the project area and an extended survey area of 100 meters of the northern boundary. Six historic-era sites occur in the project area and 10 sites occur in the extended survey area. Only one of the sites is believed to be associated with pre-

Contact and/or early historic times. State Site 50-30-10-2250, the agricultural heiau, and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area. The remaining sites consist of historic-era bridges, ditches, culverts, retaining walls, and a flume system dating from the 20th century and are affiliated with sugarcane cultivation.

That a majority of the documented sites are related to the historic-era is not surprising, given the massive landscape modifications that occurred during intensive sugarcane cultivation on the valley floor. Even historic era cultural materials associated with the many Land Commission Awards in the project area were non-existent, as explored through survey and subsurface exploration.

The sixteen historic properties have been assessed for significance by the archaeological consultant and the dairy project is anticipated to have no impact on these sites. No further archaeological work is recommended for the sites. Two of the sixteen sites are considered significant under multiple criteria, but occur outside the project area on lands owned by a different landowner. Both sites will not be adversely affected by the proposed dairy project. No site is related to burials, and no bonex were found. Such sites have been reported along coastal areas in sand dunes.

The cultural assessment examined the potential effect of the project on cultural resources, practices or beliefs, its potential to isolate cultural resources, practices or beliefs from their setting, and the potential of the project to introduce elements which may alter the setting in which cultural practices take place. Information received from the community indicates the Māhā'ulepū Ahupua'a, has been and is currently used for traditional cultural purposes. However, the dairy project area has not been included in these activities. It is clear that the gathered plants, trails, State Site 50-30-10-2250, the agricultural heiau, and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area.

The project will be fully enclosed by perimeter fencing along the boundary of the leased premises, which will ensure that project activities and any related impacts are contained within the project area. Based on the research and comments received from the community, it is reasonable to conclude that, pursuant to Act 50, the exercise of native Hawaiian rights or any ethnic group related to numerous traditional cultural practices will not be impacted by establishment of the dairy.

PESTS: A study of invertebrate species and pest insects was conducted by Steven Lee Montgomery, PhD, Consulting Biologist in January 2016. The study summarizes the presence or absence of native species or pest species associated with cattle manure in the general Māhā'ulepū area, as well as the parasites and predators that control those species. No federally or state listed endangered or threatened invertebrate species were noted in the survey of the site. A full report and list of species found on site is provided in EIS Section 4.11 and Appendix B.

Flies were identified on the HDF site using manure from neighboring livestock as bait for invertebrates. The two flies associated with livestock are the stable fly and the horn fly, the latter known for biting cattle. These flies and the greenbottle fly are often confused with the house fly. Flies known to exist on Kaua'i but not seen at the

HDF site include the house fly, the dog dung fly, and the chicken dung fly. These pests are common in areas with high pet populations. It is possible these fly species could inadvertently be brought to the dairy and utilize manure as a food source. HDF will prevent and control fly population growth through diligent clean up and sanitation practices regarding any trash and food waste, as well as through efficient manure composting practices. A full list of site management measures is provided in EIS Section 4.11. The project location does not provide any habitat for *drosophila musaphilia*, the only Kaua'i species of native Hawaiian fly listed as Endangered or Threatened. Native Drosophila habitat is located many miles away in the high elevation koa-'ōhi'a forests.

Fly populations at HDF will be minimized through a process known as Integrated Pest Management (IPM). Essentially, IPM disrupts reproduction with appropriate means at key points in the pest's life cycle. Used in Hawai'i for decades, a number of invertebrates and a bird (the cattle egret) were introduced between 1898 and 1950 to reduce livestock-related insects. IPM utilizes knowledge of the ancient food web among species.

An especially important insect to minimize fly breeding habitat in manure is the dung beetle, which buries manure and incorporates it into the soil. Populations of dung beetles found on Kaua'i and those species already in Māhā'ulepū Valley, will increase with the increased manure food source, thus increasing and speeding breakdown of manure. Dung beetles are specialists in the very important natural process of breaking up and quickly recycling bovine manure pads. The behavioral diversity among dung beetle species will work together to bury dung pats in one to three days, a shorter amount of time than the 10-30 days flies eggs need to hatch.

In the Kōloa-Po'ipū region, pest fly populations are dependent upon food and breeding sources nearby such as dog, cat, and chicken feces. Beef cattle graze in the region on agricultural lands along Ala Kinoiki Road between Kōloa and Po'ipū, and it is likely the livestock-related flies identified at the HDF site occur in this region as well. Localized controls to reduce pest populations need to address breeding sites in and amongst the food and animals wastes within the area. These mitigation measures will make it difficult for flies to breed, and BMPs will be enforced to address any increase in population, therefore it is expected that the dairy farm will not significantly affect recreational and resort areas.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhā'ulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhā'ulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Po'ipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhā'ulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawai'i Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhā'ulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhāʻulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhāʻulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kaua'i community.

Regional Water Demand: The adjacent, developed Kōloa-Po'ipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kaua'i will increase county-wide by 17,300 residents by 2030. The South Kaua'i population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kaua'i region (the Kōloa - Po'ipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhāʻulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhāʻulepū watershed.

The HDF site is located on the bottom-land of the upper Māhāʻulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Ha'upu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhāʻulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kaua'i Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhāʻulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhāʻulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhāʻulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top

of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Poʻipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kauaʻi community.

AIR QUALITY: As a part of the Environmental Impact Statement (EIS), existing air quality conditions and project impacts were evaluated, including dust and odor. Potential odors and emission levels for air pollutants relevant to dairy operations were modeled, as currently there are no cows on site. EIS sections 4.19 and 4.25 provide an evaluation of air quality and odors, including a windrose depicting wind speed and direction in the area (see DEIS Section 4.1, Climate). The full air quality technical report can be found in Draft EIS Appendix I.

Clean Air Act

Under the *Clean Air Act of 1970* (CAA), amended November 1990, the U.S. Environmental Protection Agency (EPA) regulates both large and small sources of air pollutants by establishing National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. The State of Hawaiʻi has established its own *State Ambient Air Quality Standards* (SAAQS) that are as strict or, in some cases more strict than the NAAQS. State standards prohibit any visible emissions of fugitive dust from construction activities at the property line.

Emissions relevant to livestock operation include particulate matter and fugitive dust. Greenhouse gases related to dairy cows include methane (CH_4) from enteric fermentation, and both methane and nitrous oxide (N_20) emissions from manure

application. No State or Federal regulations for greenhouse gas emissions from farm operations or small businesses currently exist.

DUST

Dust will be generated as cows move along soft limestone walkways that connect the paddocks and lead to and from the milking parlor. Potential fugitive dust emission rates were estimated from published literature, where particulate matter (PM) is measurable from the "drylots" of confined dairy operations where animals walk over dirt and dried manure throughout the day.

Applying the emission rates from this available literature greatly overestimates potential emission resulting from HDF. Cows in the pastoral rotational-grazing system will be on pasture 22 hours each day and will spend two hours – in two separate milking cycles –moving to and from the barn for the 10- to 15-minute milking sessions.

Using atmospheric dispersion modeling system (AERMOD), the rates were scaled to the size of the non-pasture areas used by cows at HDF. Results were added to the background concentration of particulate matter (both PM_{10} and $PM_{2.5}$) measured on the island of Kaua'i, and the total concentration was compared to the State ambient air quality standards. Only the contemplated herd size of up to 2,000 mature dairy cows was modeled, as at the lower threshold of 699 cows, the potential fugitive dust impact would be negligible. The estimated concentration for PM_{10} is 2.01 $\mu g/m^3$, well below the State standard of 150 $\mu g/m^3$. The estimated concentration for $PM_{2.5}$ is 0.23 $\mu g/m^3$, well below the Federal standard of 35 $\mu g/m^3$ (see Draft EIS Section 4.19 and Table 4-19.2).

ODOR

Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF, so air dispersion models were used to determine potential odor levels. Local weather data was used in conjunction with the AERMOD modeling system, and published rates for manure odors emissions for dairy heifers and effluent ponds were adapted to reflect the HDF facilities.

Odor emission sources identified for modeling at HDF were manure in the pasture fields, irrigation water containing diluted nutrients from effluent, the effluent storage ponds, and the dairy buildings. Odor rates from published research were applied. Odor isopleths (a line used to map all points having the same numerical value) were created to display the model findings. Odor is described in "odor units" at the threshold of perception, which is defined by the point at which 50 percent of panelists, in laboratory conditions, cannot smell the odor but 50 percent of the panelists can detect the odor.

Modeling results were generated for worst case meteorological conditions (low wind velocity / mixing). Generally, tradewinds will disperse odors to less than detectable levels beyond the HDF site; in periods of no wind, odor may not be

dispersed creating the "worst case" scenario. In these periods without normal tradewind flow, the odor plume would extend to the south of the HDF site. Sections 4.19.2 and 4.25.2 of the EIS include graphics of the potential odor isopleths.

Results for the committed herd size of 699 mature dairy cows show that odors may be detectable by 50 percent of the sensitive population once per 200 hours, or 44 hours per year, within an area that extends approximately 1,670-feet (within one-third of a mile) beyond the dairy farm boundary, and does not reach recreational or residential areas. Results for the contemplated expanded herd size of up to 2,000 mature dairy cows show odors would not extend beyond 2,780 feet outside the HDF boundary (just over half a mile), again not reaching recreational or residential areas, and again with detection limited to 50 percent of the sensitive population approximately 44 hours per year. The parameters used in the analysis were intentionally conservative, and the impacts shown assume an unlikely confluence of worst-case meteorological data, irrigation location, and grazing location. Actual offsite odor impacts are likely to be much lower and/or less frequent than shown; it is likely odor detection beyond the HDF boundaries will be less frequent.

ALTERNATIVES: As a part of the DEIS, alternatives were evaluated that could attain the objectives of the action's purpose and need, and were compared with environmental benefits, costs, and risks of each reasonable alternative against those of the proposed dairy project. Further discussion of alternatives can be found in DEIS Section 6.

The DEIS evaluates alternatives that could attain the objectives of the action's purpose and need, and compares environmental benefits, costs, and risks of each reasonable alternative against those of the proposed action. Additionally, reasonable land use alternatives that emerged from public input during the project scoping phase are documented and briefly discussed. The alternatives that do not meet the project purpose are not advanced for analysis of environmental benefits, costs, and risks. The Environmental Impact Statement Rules, Hawai'i Administrative Rules Chapter 11-200 (HRS 11-200) requires a discussion of alternatives that could attain the objectives of the action, regardless of cost. There is no requirement for the alternatives analysis to consider every possible land use.

Four possible land uses that would not meet the project purpose are discussed. Rezoning the land for resort or residential development, or a potential conservation condemnation are two uses that were examined and eliminated from analysis. These options would not be reasonably viable given the existing private land tenure and existing zoning. Two additional alternatives were considered as reasonable land uses as they could be permitted within the existing State Land Use Agricultural District and County Agricultural Zoning District. These options include Agricultural Park with Processing Center, and development of an Agricultural Subdivision. The alternatives were examined and eliminated from further analysis, however, as they would not fulfill the project purpose.

The analysis, therefore, focuses on alternatives that meet the project purpose. Rigorous exploration and evaluation of the environmental impacts of the alternatives, including those that might enhance environmental quality or avoid,

reduce or minimize some or all of the adverse environmental effects, costs and risks. These alternatives include: (1) the development of a Conventional Feedlot Dairy (a non-pasture-based dairy) at the same location; (2) development of the Pasture-Based Dairy at an Alternative Location on Kaua'i; and (3) milk products processing by HDF. The alternative of "No Action" is also evaluated.

The alternatives analysis provides a comprehensive evaluation of the range of potential alternatives, including the two alternative development scenarios. Although the alternatives are potentially reasonable uses under existing zoning and neighboring uses, each fails to comprehensively fulfill the project requirements defined by the eight Project Objectives and the four established Evaluation Criteria (Chapter 2, Sections 2.3.3 and 2.3.4).

The essential differences as compared to the proposed action are highlighted in the following statements.

- Only one of the alternative actions (conventional feedlot alternative) would create a commercial scale dairy operation in Hawai'i, with the capability to produce 10 percent of the State's fresh milk demand thus reducing dependence on imported milk (Objective 1). This alternative, however, would not reduce reliance on costly imported fertilizer and feed (Objective 2); grow local, quality grass as a primary feedstock (Objective 3); and would not utilize 100 percent of manure on site as nutrients to grow forage for dairy cows (Criterion 4).
- None of the alternatives would secure a dairy location that meets the requirements for a pastoral, pasture-based grazing dairy: sufficient contiguous land area; available long-term land tenure; adequate potable water supply; suitable soil properties; gentle slope conditions; and accessibility (Criterion 1).
- One alternative (Agricultural Park) could potentially generate new long-term employment in the agricultural sector on Kaua'i in a wide range of positions including pasture agronomy/soils science, environmental resources management (Criterion 2).
- The Agricultural Park alternative could also develop sustainable food production utilizing Important Agricultural Lands, demonstrating the importance of long-term agricultural leases and capital investment for agricultural infrastructure, water systems and support facilities. (Criterion 3). However, after years of trying, it appears there was limited interest in such a venture.
- Finally, addressing the range of potential environmental impacts (natural, cultural, social and economic) (Objective 8) the two alternative development scenarios would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.

In contrast to the other options considered, the planned agricultural operation of Hawai'i Dairy Farms, was determined to be the most viable option and is the preferred alternative. Of all the alternatives considered, this is the only approach that achieves project objectives and meets each of the four Evaluation Criteria.

- Hawai'i Dairy Farms will create a commercial scale pasture-based dairy operation in Hawai'i, with the capability to provide more than 1,000,000 gallons of the fresh milk demand, reducing dependence on imported milk (Objective 1).
- The planned dairy location meets the requirements of minimum land area, soil properties, slope conditions, water supply, land tenure and availability, and accessibility (Criterion 1).
- The planned action will generate new long-term employment in the agricultural sector on Kaua'i, including pasture agronomy/soils science, veterinary and animal husbandry, environmental resources management, milk/milk processing, and dairy business management (Criterion 2).
- Sustainable food production utilizing Important Agricultural Lands (Criterion 3) will occur with the proposed action, demonstrating the importance of long term agricultural leases, and the ability to draw capital investment for agricultural infrastructure including water systems and support facilities (Criterion 3).
- Address the range of potential environmental impacts by utilizing 100 percent of manure as natural fertilizer to grow the majority of food for cows (Criterion 4). The alternatives evaluated would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.
- Creating an economically viable pasture rotational-grazing model maintains agriculture, retains open space, and provides buffer between highly utilized resort and residential development and sensitive natural or cultural resources (Objective 8).

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

RECEIVED

FEB 24 2015

GROUP 70 INTL

February 21, 2015

Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, HI 96813

We are fortunate to live on the beautiful island of Kauai on a part-time basis, 4 months a year. We have been coming here for over 20 years, and truly believe this is one of the most beautiful places to be.

It is greatly distressing to us to hear about the proposed dairy farm on the Mahaulepu site in Poipu. This is such a pristine site and includes many archeological sites and sacred grounds for the Hawaiian people. These areas have been protected for hundreds of years, and now could be destroyed with the dairy farm operation. It may not be a direct destruction, but the volume of cow manure produced in such a small area has to go somewhere, and the many beautiful sites here are the ones at risk for run off and contamination.

There is already water pollution in the area from the local stream, and they still can't determine where it originates. What will occur if you had thousands of pounds of cow manure? There is not a holding tank that could contain the volume, especially in the heavy rains that occur in the area on a periodic basis. The fragile ecosystem we have will be eliminated, and there are many people who enjoy the tidepools and other areas on a daily basis who will no longer have the experience.

Currently, tourism is the major industry on this beautiful island, with the Poipu area being a major draw with the fine hotels and accommodations available. We are home to several great beaches, as well as top notch restaurants and shops. I can't imagine anyone wanting to spend time in paradise smelling cows and swatting flies while sitting on a beach when there are so many other options to choose from. It is amazing how the crowds have increased over the years we have been coming here, and that is a positive for Kauai and the economy.

We do not want to see our beautiful Poipu area destroyed by this dairy farm. There are many acres of other sites on the island that would be a better locale for such an endeavor—why not start with the former dairy farm that was destroyed in the hurricane by Anahola?

Please do not let this farm proceed in Mahauleipu, and protect our home and place in paradise.

Gary + Jackie Heinen

Gary and Jackie Heinen
1901 Poipu Road, #713
Koloa, HI 96756

GROUP 70 INTERNATIONAL

May 26, 2016

Gary and Jackie Heinen
1901 Poipu Road #713
Koloa, HI 96756

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Gary and Jackie Heinen:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

ARCHAEOLOGICAL AND CULTURAL: The Hawai'i Dairy Farms (HDF) project is subject to a historic preservation review by the State Department of Land and Natural Resources, State Historic Preservation Division (SHPD) under HRS Chapter 6E and Chapter 13-284. An Archaeological Inventory Survey (AIS) and a Cultural Impact Assessment (CIA) were conducted by Scientific Consultant Services (SCS) for the proposed project. EIS Sections 4.7 and 4.8 provide an evaluation of archaeology and cultural resources, with technical studies in Appendix G and H.

A total of sixteen historic properties were identified through a pedestrian survey of the project area and an extended survey area of 100 meters of the northern boundary. Six historic-era sites occur in the project area and 10 sites occur in the extended survey area. Only one of the sites is believed to be associated with pre-Contact and/or early historic times. State Site 50-30-10-2250, the agricultural heiau,

and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area. The remaining sites consist of historic-era bridges, ditches, culverts, retaining walls, and a flume system dating from the 20th century and are affiliated with sugarcane cultivation.

That a majority of the documented sites are related to the historic-era is not surprising, given the massive landscape modifications that occurred during intensive sugarcane cultivation on the valley floor. Even historic era cultural materials associated with the many Land Commission Awards in the project area were non-existent, as explored through survey and subsurface exploration.

The sixteen historic properties have been assessed for significance by the archaeological consultant and the dairy project is anticipated to have no impact on these sites. No further archaeological work is recommended for the sites. Two of the sixteen sites are considered significant under multiple criteria, but occur outside the project area on lands owned by a different landowner. Both sites will not be adversely affected by the proposed dairy project. No site is related to burials, and no bonex were found. Such sites have been reported along coastal areas in sand dunes.

The cultural assessment examined the potential effect of the project on cultural resources, practices or beliefs, its potential to isolate cultural resources, practices or beliefs from their setting, and the potential of the project to introduce elements which may alter the setting in which cultural practices take place. Information received from the community indicates the Māhāʻulepū Ahupuaʻa, has been and is currently used for traditional cultural purposes. However, the dairy project area has not been included in these activities. It is clear that the gathered plants, trails, State Site 50-30-10-2250, the agricultural heiau, and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area.

The project will be fully enclosed by perimeter fencing along the boundary of the leased premises, which will ensure that project activities and any related impacts are contained within the project area. Based on the research and comments received from the community, it is reasonable to conclude that, pursuant to Act 50, the exercise of native Hawaiian rights or any ethnic group related to numerous traditional cultural practices will not be impacted by establishment of the dairy.

DEMOGRAPHIC AND ECONOMIC: The potential impacts of Hawai'i Dairy Farms (HDF) to the existing economy were evaluated in the Draft Environmental Impact Statement (EIS), including a fiscal impact assessment report completed in April, 2016 by Plasch Economics Pacific. Draft EIS Section 4.15 addresses demographic and economic factors, with the complete report in Appendix J.

The HDF project would create short-term benefits through jobs for local construction personnel and local material suppliers. Such jobs would include equipment operators, cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, supervisors, painters, etc. Based on State employment multipliers, indirect employment related to Dairy construction would be expected to average about 16 jobs on Kaua'i, and 8 on O'ahu. Construction employment would be expected to average about 12 jobs per year during the

development period. Thus direct-plus-indirect employment association with construction would be expected to average approximately 36 jobs, of which 28 would be on Kaua'i.

The HDF project would contribute to diversification of Kaua'i's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Hawai'i Island), approximately10 percent of Hawai'i's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and indirect full-time equivalent jobs on Kaua'i, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on O'ahu.

HDF is expected to generate a net income of approximately $68,000 to the County when the 699 cow herd is established. When the dairy has matured to full production for the 699 cow dairy, net income to the State is calculated at $160,000 annually. With the potential contemplated herd size of up to 2,000 mature dairy cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be produced. This would double local milk production currently supplied by operational dairies on the Island of Hawai'i.

Additional employment generated by a possible expansion to accommodate the contemplated 2,000 mature dairy cow herd is estimated at approximately 3 construction jobs plus 4 indirect jobs on Kaua'i, and 2 indirect jobs on O'ahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an additional 5 full-time farm jobs would be added, with approximately 15 additional indirect jobs on Kaua'i and another 8 indirect jobs on O'ahu.

The dairy is expected to generate a net additional contribution to the County of approximately $8,000 for improvements related to expansion for the contemplated herd size of up to 2,000 mature dairy cows ($76,000 total versus $68,000 for the committed herd size). The State will derive approximately $360,000 annually in revenues from the contemplated 2,000-mature dairy cow dairy.

Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E

and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhāʻulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhāʻulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Poʻipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhāʻulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawaiʻi Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhāʻulepū 14 well during the sugarcane

plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhāʻulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhāʻulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kauaʻi community.

Regional Water Demand: The adjacent, developed Kōloa-Poʻipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kauaʻi will increase county-wide by 17,300 residents by 2030. The South Kauaʻi population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kauaʻi region (the Kōloa - Poʻipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhāʻulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhāʻulepū watershed.

The HDF site is located on the bottom-land of the upper Māhāʻulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Haʻupu Ridge. These normally dry streams converge into man-made channels running

through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhāʻulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kauaʻi Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhāʻulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhāʻulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhāʻulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or

maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater

and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Po'ipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kaua'i community.

ALTERNATIVES: As a part of the DEIS, alternatives were evaluated that could attain the objectives of the action's purpose and need, and were compared with environmental benefits, costs, and risks of each reasonable alternative against those of the proposed dairy project. Further discussion of alternatives can be found in DEIS Section 6.

The DEIS evaluates alternatives that could attain the objectives of the action's purpose and need, and compares environmental benefits, costs, and risks of each reasonable alternative against those of the proposed action. Additionally, reasonable land use alternatives that emerged from public input during the project scoping phase are documented and briefly discussed. The alternatives that do not meet the project purpose are not advanced for analysis of environmental benefits, costs, and risks. The Environmental Impact Statement Rules, Hawai'i Administrative Rules Chapter 11-200 (HRS 11-200) requires a discussion of alternatives that could attain the objectives of the action, regardless of cost. There is no requirement for the alternatives analysis to consider every possible land use.

Four possible land uses that would not meet the project purpose are discussed. Rezoning the land for resort or residential development, or a potential conservation condemnation are two uses that were examined and eliminated from analysis. These options would not be reasonably viable given the existing private land tenure and existing zoning. Two additional alternatives were considered as reasonable land uses as they could be permitted within the existing State Land Use Agricultural District and County Agricultural Zoning District. These options include Agricultural Park with Processing Center, and development of an Agricultural Subdivision. The alternatives were examined and eliminated from further analysis, however, as they would not fulfill the project purpose.

The analysis, therefore, focuses on alternatives that meet the project purpose. Rigorous exploration and evaluation of the environmental impacts of the alternatives, including those that might enhance environmental quality or avoid, reduce or minimize some or all of the adverse environmental effects, costs and risks. These alternatives include: (1) the development of a Conventional Feedlot Dairy (a non-pasture-based dairy) at the same location; (2) development of the Pasture-Based Dairy at an Alternative Location on Kaua'i; and (3) milk products processing by HDF. The alternative of "No Action" is also evaluated.

The alternatives analysis provides a comprehensive evaluation of the range of potential alternatives, including the two alternative development scenarios. Although the alternatives are potentially reasonable uses under existing zoning and neighboring uses, each fails to comprehensively fulfill the project requirements defined by the eight Project Objectives and the four established Evaluation Criteria (Chapter 2, Sections 2.3.3 and 2.3.4).

The essential differences as compared to the proposed action are highlighted in the following statements.

- Only one of the alternative actions (conventional feedlot alternative) would create a commercial scale dairy operation in Hawai'i, with the capability to produce 10 percent of the State's fresh milk demand thus reducing dependence on imported milk (Objective 1). This alternative, however, would not reduce reliance on costly imported fertilizer and feed (Objective 2); grow local, quality grass as a primary feedstock (Objective 3); and would not utilize 100 percent of manure on site as nutrients to grow forage for dairy cows (Criterion 4).
- None of the alternatives would secure a dairy location that meets the requirements for a pastoral, pasture-based grazing dairy: sufficient contiguous land area; available long-term land tenure; adequate potable water supply; suitable soil properties; gentle slope conditions; and accessibility (Criterion 1).
- One alternative (Agricultural Park) could potentially generate new long-term employment in the agricultural sector on Kaua'i in a wide range of positions including pasture agronomy/soils science, environmental resources management (Criterion 2).
- The Agricultural Park alternative could also develop sustainable food

production utilizing Important Agricultural Lands, demonstrating the importance of long-term agricultural leases and capital investment for agricultural infrastructure, water systems and support facilities. (Criterion 3). However, after years of trying, it appears there was limited interest in such a venture.

- Finally, addressing the range of potential environmental impacts (natural, cultural, social and economic) (Objective 8) the two alternative development scenarios would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.

In contrast to the other options considered, the planned agricultural operation of Hawai'i Dairy Farms, was determined to be the most viable option and is the preferred alternative. Of all the alternatives considered, this is the only approach that achieves project objectives and meets each of the four Evaluation Criteria.

- Hawai'i Dairy Farms will create a commercial scale pasture-based dairy operation in Hawai'i, with the capability to provide more than 1,000,000 gallons of the fresh milk demand, reducing dependence on imported milk (Objective 1).
- The planned dairy location meets the requirements of minimum land area, soil properties, slope conditions, water supply, land tenure and availability, and accessibility (Criterion 1).
- The planned action will generate new long-term employment in the agricultural sector on Kaua'i, including pasture agronomy/soils science, veterinary and animal husbandry, environmental resources management, milk/milk processing, and dairy business management (Criterion 2).
- Sustainable food production utilizing Important Agricultural Lands (Criterion 3) will occur with the proposed action, demonstrating the importance of long term agricultural leases, and the ability to draw capital investment for agricultural infrastructure including water systems and support facilities (Criterion 3).
- Address the range of potential environmental impacts by utilizing 100 percent of manure as natural fertilizer to grow the majority of food for cows (Criterion 4). The alternatives evaluated would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.
- Creating an economically viable pasture rotational-grazing model maintains agriculture, retains open space, and provides buffer between highly utilized resort and residential development and sensitive natural or cultural resources (Objective 8).

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

RECEIVED

FEB 24 2015

GROUP 70 INTL

From: larry heller <hellerl001@hawaii.rr.com>
Subject: **Comments for the EIS ont he Hawaii Dairy Farm plan for Kauai**
Date: February 23, 2015 10:03:49 AM HST
To: HDF@Group70int.com
Cc: epo@doh.hawaii.gov
Bcc: Joan Heller <myoho@hawaii.rr.com>

These are my concerns that need to be addressed and answered by the EIS (Environmental Impact Statement) for this Dairy farm.

First, why is the same company (Group 70 International) that designed the buildings and waste pools for this Dairy handling this EIS. Why is it not an independent 3 rd party that specializes in doing EIS studies?

The HDF (Hawaii Dairy Farm, LLC) independently modified the design of the effluent ponds after having received additional rainfall data and as a result of a"collaborative effort" with the community and the DOH. But why was the initial plan for the ponds was submitted without adequate soil analysis and without accurate storm data or rainfall readings?

Why did HDF exclude the results of the "Custom Soil Resource Study" done by the Natural Resource Conservation Service when it filed its current Waste Management Plan with the state on July 23, 2014? The study,released June 5, 2014, focused on the proposed dairy site and concluded that HDF's plan for a land application of the cow waste would be problematic at Malhaulepu, as more than 50 % of the proposed farm soil is at high or very high risk of runoff due to its high clay content.

Why such a large operation(one that won't even keep its milk on this island!), when a much smaller and truly self-sustaining dairy could be located in many other sites within Grove Farms vast holdings and actually be a successful (& Environmentally sound) operation. Are the principles in this operation just looking to fail for some needed Tax Write-Offs???

larry heller
HELLERL001@hawaii.rr.com

Lawaii, HI 96765

GROUP 70 INTERNATIONAL

May 26, 2016

Larry Heller
P.O. Box 387
Lawaii, HI 96765
hellerl001@hawaii.rr.com

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Larry Heller:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

GROUP 70 OBJECTIVITY: Group 70 International, Inc. (Group 70) is responsible for the preparation and processing of the Hawai'i Dairy Farms Environmental Impact Statement (EIS). The EIS was prepared in accordance with the requirements of Chapter 343 Hawai'i Revised Statutes and the "Environmental Impact Statement Rules" (Chapter 200 of Title 11, Hawai'i Administrative Rules). The environmental planning team at Group 70 has prepared several hundred Environmental Assessment and EIS documents over the past 40 years, and every document has been accepted by the responsible County, State and Federal agency. On numerous past EIS projects, the Hawai'i Chapter of the American Planning Association has recognized Group 70's professional work with Chapter awards for excellence in environmental planning. Part of the EIS scoping process involves Group 70's

experienced team of technical sub consultants that are well-known and qualified in their respective fields of study. For this project, Group 70 is preparing the Hawai'i Dairy Farms EIS with the level of analysis required to properly evaluate and disclose the existing environmental conditions, probable impacts with mitigation, and potential cumulative and secondary effects.

DAIRY OPERATIONS: Hawai'i Dairy Farms (HDF) will establish and operate a sustainable, pastoral rotational-grazing dairy farm in Māhā'ulepū Valley on the island of Kaua'i to produce fresh, locally available nutritious milk for Hawai'i families. The rotational-grazing method utilizes 100 percent of the cows' manure as natural fertilizer to grow pasture grass as a primary source of nutrition for dairy cows. This cost-effective method will reduce reliance on imported fertilizer and feed. Pasture grass will comprise at least 70 percent of the animals' diet. As a part of the Draft Environmental Impact Statement (EIS), the proposed facilities and operations for the dairy farm are described in Chapter 3.

The Environmental Impact Statement (EIS) Preparation Notice (EISPN), published January 23, 2015, described the proposed pasture-based rotational grazing system as a "zero-discharge, grass-fed dairy". The term "zero-discharge" under the U.S. Environmental Protection Agency related to concentrated feeding operations (CAFO) is a system designed to not discharge pollutants into waters of the United States. As noted previously, the HDF system is designed to utilize 100 percent of the cows' manure on-site. However, nutrients would be introduced to the HDF site with any use; the Draft EIS identifies the amount of nutrients anticipated from the proposed dairy operations that could pass through to ground and surface waters. Therefore, HDF elected to discontinue use of the term "zero discharge" as it was construed as no nutrients into the system.

The term "grass-fed" was used in the HDF EISPN. This term was used to identify HDF's intent to utilize a locally-produced feedstock – grass – for more than 70 percent of the dairy herds' diet. In January 2016, the U.S. Department of Agricultural (USDA) Marketing Survey created a narrow legal definition of "grass-fed". The USDA standard defines what animals can and cannot be fed. The Food Alliance, a project of several northwest colleges, believes that when consumers choose grass-fed products there is an expectation that these will come from animals raised on pasture on a forage-based diet. Due to the evolving definition of "grass-fed", the term in not used in this EIS.

The dairy facilities will occupy an area of approximately 10 acres on the western boundary of the site. The developed area "footprint" will be less than 2 percent of the total farm area. Four buildings will be constructed to serve different functions, supported by utilities and infrastructure. Additional building information can be found in Draft EIS Section 3.3.1.

Agricultural infrastructure and utilities required for the dairy operations will include storage tanks and silos, effluent storage ponds, livestock water systems, and drainage improvements. The irrigation system and distribution of livestock water are discussed in Draft EIS Section 3.5, Pasture Management.

The pastoral rotational-grazing dairy provides a local feedstock – grass – as the herd's primary food source. Reducing imported feed stabilizes costs and provides a food source closer to the natural diet of cows. Results of grass trials initially conducted at five sites across four Hawaiian Islands were instrumental in identifying appropriate varieties of grass, and suitable sites to support sufficient "dry matter" grass yields essential to a cow's diet. Additional project-specific trials at the Māhā'ulepū site on Kauai have been conducted for more than 18 months. The results have identified sufficient yield and nutrition to supply 70 percent of the cows' diet; improvements in grass productivity are anticipated to provide up to 85 percent of cows' diet.

The pasture-based model allows cows to move about freely, and to lie down and rest, which is part of the digestion cycle. The animals are managed in social groups known as "mobs", mimicking the natural social order of bovines. Cows spend 22 hours of each 24-hour period foraging on pasture or resting, outdoors in natural light and fresh air. The gently sloped paddocks, walkways and races minimize the energy expended by the mature dairy cows as they graze or are transferred to and from the various paddocks and the mature dairy facility; surfaces of the walkways and cow races are designed to provide a comfortable path under hoof. The management practices and pasture model applied by HDF maximizes grass as the cows' primary nutrition source and minimizes stress to the animals. Cows tend to be healthier and live longer, productive lives with access to fresh air, high quality feed, and exercise while they forage.

The 470 acres of pasture will be divided into paddocks averaging 3 to 5 acres in size. Smaller paddocks located near the dairy facility will be used as temporary pasture for cows or calves being moved on or off the farm. To protect the water quality of surface water and downstream areas, paddock fences are set back 35 feet from the edge of drainage ways throughout the site. Existing vegetation within the setbacks will be managed or restored to reduce erosion, improve stability of ditch banks, increase net carbon storage, and improve and maintain water quality.

The majority of the pastures will be irrigated with non-potable water and/or diluted effluent through either the pivot irrigation systems or through gun irrigators. Irrigation water supply is provided to the farm from Waita Reservoir, and will be filtered and pumped to the various irrigation components on the farm. The irrigation system is controlled using computer software and GPS receivers to allow very precise application of irrigation and/or diluted effluent on the pasture. The pivots can rotate and apply irrigation water and/or diluted effluent at different rates depending on the actual irrigation needs of the farm.

NRCS provides technical guidance on applying agricultural waste depending on the desired use of the waste. Reflected in the title of the livestock waste guidance for Hawai'i is the parenthetical inclusion of the word "nutrients." Where waste is utilized as a resource, it is being used for the constituent components that provide benefit.

The NRCS Conservation Practice Standard 590, Nutrient Management, applies to commercial fertilizers, organic by-products, waste water, organic matter, and

irrigation water. Nutrient management is the practice of managing the amount, rate, source, method of application, and timing of plant nutrients and soil amendments. The timing and application of nutrients will correspond with plant uptake, soil properties and weather conditions. For more information on nutrient balance management see Draft EIS Section 3.5.3, and Draft EIS Appendix D.

The effluent storage ponds are sized to accommodate 30 days of storage for up to 2,000 mature dairy cows, and over 85 days of storage for 699 mature dairy cows. It will be highly unlikely that the storage pond will be full at any time for the contemplated 2,000-cow dairy, and nearly impossible for the committed 699-cow dairy. Throughout the less than 30-day storage period, effluent is planned for application every four days, and the slurry application is expected at least once every 45 days, to ensure that the ponds are kept at manageable levels.

Cows lactate milk following the birth of calves. Newborn calves will be housed on the Māhāʻulepū site and provided essential colostrum and nutrients for a healthy start. During the calves' initial 90 days, they will be transitioned to pasture at HDF before transfer to ranches on Kauaʻi to be raised off-site. The committed herd size of 699 mature dairy cows at the Māhāʻulepū site applies to mature mature dairy cows. Animals in various stages of lactation and rest will be transferred between HDF and other partner ranches as needed for animal health and dairy productivity. This will benefit both the dairy and infuse the beef market in Hawaiʻi with a new, local source of pasture-raised calves. Male calves will become part of the beef cattle herd; heifers (young female calves that haven't given birth) will be raised until ready to return to the HDF herd as a birthing/mature dairy cow. For more information on off-site herd management, refer to Section 3.7 of the Draft EIS.

Health of the herd is of primary importance as the success of a dairy relies on cows effectively producing quality milk. All cows will be treated with a high standard of care. Dairy managers and caretakers will be trained and competent in handling animals to minimize stress and ensure the herds' welfare. A licensed veterinarian may prescribe use of antibiotics approved by the Food & Drug Administration (FDA) for treatment of illnesses. Adherence to guidelines that prohibit milk from cows undergoing antibiotic treatment will ensure no adulteration of milk. Routine laboratory tests of milk for traces of antibiotic residue will be conducted. HDF will not inject cows with bovine growth hormone, referred to as rBST or rBGH.

SOILS: Soil is an ecosystem that can be managed to provide nutrients for plant growth, to absorb and hold rainwater for use during dryer periods, to filter and buffer potential pollutants from leaving fields, to serve as a firm foundation for agricultural activities, and to provide habitat for soil microbes to flourish and diversify to keep the ecosystem healthy. Two rounds of independent soil sampling were undertaken at HDF to understand and characterize available soil nutrients and conditions. Section 4.3 of the Environmental Impact Statement (EIS) characterizes soil conditions, and anticipated impacts from effluent and supplemental nutrient application. Recommendations from Dr. Russell Yost and Nicholas Krueger of the University of Hawaiʻi at Mānoa are summarized. Their baseline nutrient report is included as Appendix C of the Draft EIS.

Soil conservation is a core principal behind establishment of the NRCS, which was formed out of the Soil Conservation Service to acknowledge its expanded role in watershed-scale approach using science-based tools and standards in agronomy, engineering economics, wildlife biology and other disciplines to aid landowners in implementation of conservation practices. NRCS conservation practices are listed in Chapter 3, Section 3.2; these practices codes identify design and construction standards related to drainage, materials, operations and applicable engineering standards. HDF will follow the developed Conservation Plan, which was approved by the West Kauaʻi Soil & Water Conservation District in December, 2013.

The United States Department of Agriculture (USDA) Natural Resources Conservation Services (NRCS) has mapped and classified soils for more than 95 percent of the United States. Comments received during the initial scoping for this EIS included a "Custom Soils Resource Report for Island of Kauaʻi, Hawaiʻi." The report was generated from the USDA NRCS website, which allows any internet user to define an area of interest, customize data results, and generate a Custom Soil Resource Report. The user can select or deselect parameters based upon which data the user would like to display. These user-generated reports are not evaluated by NRCS.

The NRCS soils classifications and descriptions provide a good information base, however, in-field soils testing is needed to identify existing soil nutrient levels and conditions. The most abundant soil types at the HDF site are Kalihi Clay at 32 percent, Kaʻena Clay Brown Variant at 29 percent, and Lualualei Clay at roughly 14 percent of the dairy site. Laboratory analysis of soil samples collected in 2014 identified levels of pH, phosphorus, nitrogen, potassium, calcium, magnesium, organic matter, salinity, micronutrients and other constituents. The results illustrate that the soils are depleted of nutrients, which is typical for lands formerly used for sugarcane. The soil nutrient status and fertility demands of the primary crop, Kikuyu grass, were used to identify the quantities of nutrients required for productive grass growth. The soils data provide a baseline to guide adaptive nutrient management throughout establishment and maturity of the dairy.

A second round of field sampling was conducted in 2015, and focused on evaluation of soils characterized as "poorly drained", and established a quantitative baseline of soil salinity and sodicity to provide for future monitoring of soil health with application of manure effluent. Laboratory analysis determined electrical conductivity and exchangeable sodium percentage, in addition to nutrient levels of nitrogen phosphorus calcium, magnesium, and potassium.

Poorly drained is not an indication of low or poor infiltration. Infiltration refers to the ability of water to enter the soil surface, whereas "drainage" refers to the movement of water within or from the soil profile. Poorly drained soils typically have low hydraulic conductivity, or a slow rate of groundwater movement through the soil. This slow movement can create anaerobic conditions, which typically result in higher rates of denitrification. This is the conversion of potentially nitrates and nitrites to gaseous forms, which reduces the potential for impacts on waterbodies. In this way, "poorly drained" soils may represent less risk of nitrate and nitrite leaching to associated waterbodies than "well drained" soils (Yost, 2016).

As a result of reduced movement of water through the soil profile, the mobility of nutrients such as potassium and phosphorus is also reduced. Soil types at the HDF site are known to adsorb and retain large amounts of phosphorus. Under the NRCS phosphorus leaching index for Hawai'i soils, HDF soils show low risk for leaching. With low risk, phosphorus can be applied at rates greater than crop requirements if manure or other organic materials are used to supply nutrients.

The dairy's focus on robust and healthy grass growth will build organic matter in soils through use of manure as a natural fertilizer. Soil can incorporate carbon from the atmosphere, which benefits soil health. According to recent studies in the Soil Science Society of America Journal, the conversion of formerly tilled cropland to grazed pasture can drive substantial accumulation of organic carbons in soil, with a potential to offset up to one-third of the annual increase in atmospheric carbon dioxide. The potential soil organic matter and carbon dioxide sequestration benefits are likely greatest in highly degraded soils in warm subtropical climates, partly due to long pasture-growing seasons. Long-term soil impacts are anticipated to result in improvement to the physical, chemical, and biological condition of the soil.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhā'ulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhā'ulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of

soils in the adjacent Kōloa-Po'ipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhā'ulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawai'i Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhā'ulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhā'ulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhā'ulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kaua'i community.

Regional Water Demand: The adjacent, developed Kōloa-Poʻipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kauaʻi will increase county-wide by 17,300 residents by 2030. The South Kauaʻi population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kauaʻi region (the Kōloa - Poʻipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhāʻulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhāʻulepū watershed.

The HDF site is located on the bottom-land of the upper Māhāʻulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Haʻupu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhāʻulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kauaʻi Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore

recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhāʻulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhāʻulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhāʻulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to

increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Poʻipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kauaʻi community.

ALTERNATIVES: As a part of the DEIS, alternatives were evaluated that could attain the objectives of the action's purpose and need, and were compared with environmental benefits, costs, and risks of each reasonable alternative against those of the proposed dairy project. Further discussion of alternatives can be found in DEIS Section 6.

The DEIS evaluates alternatives that could attain the objectives of the action's purpose and need, and compares environmental benefits, costs, and risks of each reasonable alternative against those of the proposed action. Additionally, reasonable land use alternatives that emerged from public input during the project scoping phase are documented and briefly discussed. The alternatives that do not meet the project purpose are not advanced for analysis of environmental benefits, costs, and risks. The Environmental Impact Statement Rules, Hawaiʻi Administrative Rules Chapter 11-200 (HRS 11-200) requires a discussion of alternatives that could attain the objectives of the action, regardless of cost. There is no requirement for the alternatives analysis to consider every possible land use.

Four possible land uses that would not meet the project purpose are discussed. Rezoning the land for resort or residential development, or a potential conservation condemnation are two uses that were examined and eliminated from analysis. These options would not be reasonably viable given the existing private land tenure and existing zoning. Two additional alternatives were considered as reasonable land uses as they could be permitted within the existing State Land Use Agricultural District and County Agricultural Zoning District. These options include Agricultural Park with Processing Center, and development of an Agricultural Subdivision. The alternatives were examined and eliminated from further analysis, however, as they would not fulfill the project purpose.

The analysis, therefore, focuses on alternatives that meet the project purpose. Rigorous exploration and evaluation of the environmental impacts of the alternatives, including those that might enhance environmental quality or avoid, reduce or minimize some or all of the adverse environmental effects, costs and risks. These alternatives include: (1) the development of a Conventional Feedlot Dairy (a non-pasture-based dairy) at the same location; (2) development of the Pasture-Based Dairy at an Alternative Location on Kauaʻi; and (3) milk products processing by HDF. The alternative of "No Action" is also evaluated.

The alternatives analysis provides a comprehensive evaluation of the range of potential alternatives, including the two alternative development scenarios. Although the alternatives are potentially reasonable uses under existing zoning and

neighboring uses, each fails to comprehensively fulfill the project requirements defined by the eight Project Objectives and the four established Evaluation Criteria (Chapter 2, Sections 2.3.3 and 2.3.4).

The essential differences as compared to the proposed action are highlighted in the following statements.

- Only one of the alternative actions (conventional feedlot alternative) would create a commercial scale dairy operation in Hawai'i, with the capability to produce 10 percent of the State's fresh milk demand thus reducing dependence on imported milk (Objective 1). This alternative, however, would not reduce reliance on costly imported fertilizer and feed (Objective 2); grow local, quality grass as a primary feedstock (Objective 3); and would not utilize 100 percent of manure on site as nutrients to grow forage for dairy cows (Criterion 4).
- None of the alternatives would secure a dairy location that meets the requirements for a pastoral, pasture-based grazing dairy: sufficient contiguous land area; available long-term land tenure; adequate potable water supply; suitable soil properties; gentle slope conditions; and accessibility (Criterion 1).
- One alternative (Agricultural Park) could potentially generate new long-term employment in the agricultural sector on Kaua'i in a wide range of positions including pasture agronomy/soils science, environmental resources management (Criterion 2).
- The Agricultural Park alternative could also develop sustainable food production utilizing Important Agricultural Lands, demonstrating the importance of long-term agricultural leases and capital investment for agricultural infrastructure, water systems and support facilities. (Criterion 3). However, after years of trying, it appears there was limited interest in such a venture.
- Finally, addressing the range of potential environmental impacts (natural, cultural, social and economic) (Objective 8) the two alternative development scenarios would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.

In contrast to the other options considered, the planned agricultural operation of Hawai'i Dairy Farms, was determined to be the most viable option and is the preferred alternative. Of all the alternatives considered, this is the only approach that achieves project objectives and meets each of the four Evaluation Criteria.

- Hawai'i Dairy Farms will create a commercial scale pasture-based dairy operation in Hawai'i, with the capability to provide more than 1,000,000 gallons of the fresh milk demand, reducing dependence on imported milk (Objective 1).
- The planned dairy location meets the requirements of minimum land area, soil properties, slope conditions, water supply, land tenure and availability, and accessibility (Criterion 1).
- The planned action will generate new long-term employment in the

agricultural sector on Kaua'i, including pasture agronomy/soils science, veterinary and animal husbandry, environmental resources management, milk/milk processing, and dairy business management (Criterion 2).
- Sustainable food production utilizing Important Agricultural Lands (Criterion 3) will occur with the proposed action, demonstrating the importance of long term agricultural leases, and the ability to draw capital investment for agricultural infrastructure including water systems and support facilities (Criterion 3).
- Address the range of potential environmental impacts by utilizing 100 percent of manure as natural fertilizer to grow the majority of food for cows (Criterion 4). The alternatives evaluated would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.
- Creating an economically viable pasture rotational-grazing model maintains agriculture, retains open space, and provides buffer between highly utilized resort and residential development and sensitive natural or cultural resources (Objective 8).

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

Tom and Ann Hennessy
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February 21, 2015

State of Hawaii Dept of Health
Environmental Planning Office
919 Ala Moana Blvd Room 312
Honolulu HI 96814
epo@doh.hawaii.gov

Dear Planning Staff members:

Thanks for the opportunity to submit our questions as part of the Maha'ulepu Dairy EIS process. We are homeowners in Koloa but also own two homes in the Southland region of New Zealand. We have seen the impact of the "white miracle" on Southland waterways. Once renowned for its fly fishing rivers and streams, New Zealand now finds many waterways in Southland polluted and clogged with "didymo"(footnote 1), making proximity to waterways unpleasant and unsuitable for recreation because of the unpleasant odor and appearance. The spread of didymo coincided with the spread of industrial dairies.

In New Zealand, the main problem seems to be that, even though there are regulations governing water pollution, there is lack of enforcement. This is an ongoing issue in normal times, but in times of extreme weather the problem is chronic. 6 months ago, heavier than normal rainfall led to the relaxation of what environmental standards did exist, allowing farmers to release toxic effluent from their ponds to avoid complete collapse of their reinforcing structures (footnote 2).

So, we have three questions. First – what regulations are in effect to govern water quality, who will enforce them and does that agency have sufficient resources to ensure that regulations are not breached?

Second, what provisions are going to be made to for extreme weather events?

Third, why does this project have to be placed near an area that is so important for tourism, which provides so many jobs and contributes so much to the economy? Pollution will certainly impact the number of tourism jobs on the South Shore and provide few jobs in return. In New Zealand, industrial dairy positions are usually filled by migrant workers because they are so unpleasant that New Zealanders do not want them.

Best regards,

Tom and Ann Hennessy

1. Didymosphenia geminata. http://en.wikipedia.org/wiki/Didymosphenia_geminata
2. https://agrihq.co.nz/article/effluent-exemptions-for-southland-dairy-farmers?p=11

GROUP 70 INTERNATIONAL

May 26, 2016

Tom and Ann Hennessy
2330 Ho'ohu Road # 22
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annchennessy@aol.com

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Tom and Ann Hennessy:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

NATURAL HAZARDS: The potential impacts of natural hazards are evaluated in the Draft Environmental Impact Statement (EIS), including flooding, tsunami, earthquakes, and hurricanes. Draft EIS Section 4.6 addresses natural hazards.

The Māhā'ulepū property is not known to experience flooding conditions. The area is located within Federal Emergency Management Agency (FEMA) Zone X, areas determined to be outside the 0.2% annual chance floodplain. The proposed location for Hawai'i Dairy Farms (HDF) lies between the 60 and 150 feet elevation, outside the tsunami evacuation zone. The Kaua'i and Ni'ihau region of the Hawaiian Islands has experienced tremors from earthquakes originating further south in the island chain, but no known seismic activity has originated among these northern islands.

Although they occur infrequently, Kaua'i has received a greater amount of damage from hurricanes when compared to the other Hawaiian Islands. Land management personnel in the Māhā'ulepū region during and following the hurricanes that affected Kaua'i in 1982 and 1992 observed defoliation of vegetation, and no flooding events in the period following passage of the storms.

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An emergency preparedness plan for protection of animals has been prepared for HDF internal use that addresses hurricane, fire, and potential flooding hazard scenarios. HDF is not in a tsunami inundation area, so this scenario is not planned for in the disaster plan. The disaster plan relies upon knowledge of cow behavior, and is based on extensive guidance for livestock protection from NRCS, the Florida State Agricultural Response Team (SART), Pennsylvania State College of Agricultural Sciences, and Cornell University Cooperative Extension. The plan includes safety procedures during any disaster, follow up actions, and emergency contacts for assistance before, during or following the event. Further information is provided in the Draft EIS Section 4.6.2.

DEMOGRAPHIC AND ECONOMIC: The potential impacts of Hawai'i Dairy Farms (HDF) to the existing economy were evaluated in the Draft Environmental Impact Statement (EIS), including a fiscal impact assessment report completed in April, 2016 by Plasch Economics Pacific. Draft EIS Section 4.15 addresses demographic and economic factors, with the complete report in Appendix J.

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The HDF project would contribute to diversification of Kaua'i's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Hawai'i Island), approximately10 percent of Hawai'i's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and indirect full-time equivalent jobs on Kaua'i, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on O'ahu.

HDF is expected to generate a net income of approximately $68,000 to the County when the 699 cow herd is established. When the dairy has matured to full production for the 699 cow dairy, net income to the State is calculated at $160,000 annually. With the potential contemplated herd size of up to 2,000 mature dairy cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be produced. This would double local milk production currently supplied by operational dairies on the Island of Hawai'i.

Additional employment generated by a possible expansion to accommodate the contemplated 2,000 mature dairy cow herd is estimated at approximately 3 construction jobs plus 4 indirect jobs on Kaua'i, and 2 indirect jobs on O'ahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an additional 5 full-time farm jobs would be added, with approximately 15 additional indirect jobs on Kaua'i and another 8 indirect jobs on O'ahu.

The dairy is expected to generate a net additional contribution to the County of approximately $8,000 for improvements related to expansion for the contemplated herd size of up to 2,000 mature dairy cows ($76,000 total versus $68,000 for the committed herd size). The State will derive approximately $360,000 annually in revenues from the contemplated 2,000-mature dairy cow dairy.

Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhāʻulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhāʻulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Poʻipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhāʻulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawaiʻi Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhāʻulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhāʻulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhāʻulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kaua'i community.

Regional Water Demand: The adjacent, developed Kōloa-Poʻipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kaua'i will increase county-wide by 17,300 residents by 2030. The South Kaua'i population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kaua'i region (the Kōloa - Poʻipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhāʻulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhāʻulepū watershed.

The HDF site is located on the bottom-land of the upper Māhāʻulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Ha'upu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhāʻulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kaua'i Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhā'ulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhā'ulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhā'ulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top

of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhā'ulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Po'ipū region were also calculated. Nitrogen input to the marine environment in the Po'ipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Po'ipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kaua'i community.

AIR QUALITY: As a part of the Environmental Impact Statement (EIS), existing air quality conditions and project impacts were evaluated, including dust and odor. Potential odors and emission levels for air pollutants relevant to dairy operations were modeled, as currently there are no cows on site. EIS sections 4.19 and 4.25 provide an evaluation of air quality and odors, including a windrose depicting wind speed and direction in the area (see DEIS Section 4.1, Climate). The full air quality technical report can be found in Draft EIS Appendix I.

Clean Air Act

Under the *Clean Air Act of 1970* (CAA), amended November 1990, the U.S. Environmental Protection Agency (EPA) regulates both large and small sources of air pollutants by establishing National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. The State of Hawai'i has established its own *State Ambient Air Quality Standards* (SAAQS) that are as strict or, in some cases more strict than the NAAQS. State standards prohibit any visible emissions of fugitive dust from construction activities at the property line.

Emissions relevant to livestock operation include particulate matter and fugitive dust. Greenhouse gases related to dairy cows include methane (CH_4) from enteric fermentation, and both methane and nitrous oxide (N_20) emissions from manure

application. No State or Federal regulations for greenhouse gas emissions from farm operations or small businesses currently exist.

DUST

Dust will be generated as cows move along soft limestone walkways that connect the paddocks and lead to and from the milking parlor. Potential fugitive dust emission rates were estimated from published literature, where particulate matter (PM) is measurable from the "drylots" of confined dairy operations where animals walk over dirt and dried manure throughout the day.

Applying the emission rates from this available literature greatly overestimates potential emission resulting from HDF. Cows in the pastoral rotational-grazing system will be on pasture 22 hours each day and will spend two hours – in two separate milking cycles –moving to and from the barn for the 10- to 15-minute milking sessions.

Using atmospheric dispersion modeling system (AERMOD), the rates were scaled to the size of the non-pasture areas used by cows at HDF. Results were added to the background concentration of particulate matter (both PM_{10} and $PM_{2.5}$) measured on the island of Kaua'i, and the total concentration was compared to the State ambient air quality standards. Only the contemplated herd size of up to 2,000 mature dairy cows was modeled, as at the lower threshold of 699 cows, the potential fugitive dust impact would be negligible. The estimated concentration for PM_{10} is 2.01 $\mu g/m^3$, well below the State standard of 150 $\mu g/m^3$. The estimated concentration for $PM_{2.5}$ is 0.23 $\mu g/m^3$, well below the Federal standard of 35 $\mu g/m^3$ (see Draft EIS Section 4.19 and Table 4-19.2).

ODOR

Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF, so air dispersion models were used to determine potential odor levels. Local weather data was used in conjunction with the AERMOD modeling system, and published rates for manure odors emissions for dairy heifers and effluent ponds were adapted to reflect the HDF facilities.

Odor emission sources identified for modeling at HDF were manure in the pasture fields, irrigation water containing diluted nutrients from effluent, the effluent storage ponds, and the dairy buildings. Odor rates from published research were applied. Odor isopleths (a line used to map all points having the same numerical value) were created to display the model findings. Odor is described in "odor units" at the threshold of perception, which is defined by the point at which 50 percent of panelists, in laboratory conditions, cannot smell the odor but 50 percent of the panelists can detect the odor.

Modeling results were generated for worst case meteorological conditions (low wind velocity / mixing). Generally, tradewinds will disperse odors to less than detectable levels beyond the HDF site; in periods of no wind, odor may not be

dispersed creating the "worst case" scenario. In these periods without normal tradewind flow, the odor plume would extend to the south of the HDF site. Sections 4.19.2 and 4.25.2 of the EIS include graphics of the potential odor isopleths.

Results for the committed herd size of 699 mature dairy cows show that odors may be detectable by 50 percent of the sensitive population once per 200 hours, or 44 hours per year, within an area that extends approximately 1,670-feet (within one-third of a mile) beyond the dairy farm boundary, and does not reach recreational or residential areas. Results for the contemplated expanded herd size of up to 2,000 mature dairy cows show odors would not extend beyond 2,780 feet outside the HDF boundary (just over half a mile), again not reaching recreational or residential areas, and again with detection limited to 50 percent of the sensitive population approximately 44 hours per year. The parameters used in the analysis were intentionally conservative, and the impacts shown assume an unlikely confluence of worst-case meteorological data, irrigation location, and grazing location. Actual offsite odor impacts are likely to be much lower and/or less frequent than shown; it is likely odor detection beyond the HDF boundaries will be less frequent.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

Tom Hennessy
2330 Ho'ohu Road # 22
Koloa, HI 96576
808 742 6459

RECEIVED
FEB 25 2015
GROUP 70 INTL

February 23, 2015

Dear Planning Staff members:

Most people on Kauai support agriculture if it is done right. If you really want to have a farm and you really want the support of the citizens, create a model that does not pollute the aquifer, does not use artificial chemical fertilizers, does not use GMO feed, and is sustainable I would suggest an organic grass fed only beef cattle farm which puts the correct amount of animals on the land that the land can support. The beef would be in high demand for local residents who would be proud to support such a venture.

The idea of an intensive dairy operation producing excessive amounts of effluent and using chemical fertilizers that pollute the aquifer, streams, beaches and coral is something that many community members cannot support. The importation of GMO feed is questionable. Water pollution and the use of non-indigenous insects to control the flies would adversely affect the tourism industry and businesses and jobs in the Poipu area.

The obvious choice for Grove Farm is to work with the community and be a hero.

Best regards,

Tom Hennessy

cc: Group 70 International, Inc., Hawaii Dairy Farms LLC

May 26, 2016

Tom Hennessy
2330 Ho'ohu Road # 22
Koloa, HI 96576
hennessyhammock@gmail.com

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Tom Hennessy:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

NATURAL HAZARDS: The potential impacts of natural hazards are evaluated in the Draft Environmental Impact Statement (EIS), including flooding, tsunami, earthquakes, and hurricanes. Draft EIS Section 4.6 addresses natural hazards.

The Māhā'ulepū property is not known to experience flooding conditions. The area is located within Federal Emergency Management Agency (FEMA) Zone X, areas determined to be outside the 0.2% annual chance floodplain. The proposed location for Hawai'i Dairy Farms (HDF) lies between the 60 and 150 feet elevation, outside the tsunami evacuation zone. The Kaua'i and Ni'ihau region of the Hawaiian Islands has experienced tremors from earthquakes originating further south in the island chain, but no known seismic activity has originated among these northern islands.

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Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhā'ulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhā'ulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Po'ipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

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The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhāʻulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhāʻulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

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Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhāʻulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhāʻulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top

of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Poʻipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kauaʻi community.

AIR QUALITY: As a part of the Environmental Impact Statement (EIS), existing air quality conditions and project impacts were evaluated, including dust and odor. Potential odors and emission levels for air pollutants relevant to dairy operations were modeled, as currently there are no cows on site. EIS sections 4.19 and 4.25 provide an evaluation of air quality and odors, including a windrose depicting wind speed and direction in the area (see DEIS Section 4.1, Climate). The full air quality technical report can be found in Draft EIS Appendix I.

Clean Air Act

Under the *Clean Air Act of 1970* (CAA), amended November 1990, the U.S. Environmental Protection Agency (EPA) regulates both large and small sources of air pollutants by establishing National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. The State of Hawaiʻi has established its own *State Ambient Air Quality Standards* (SAAQS) that are as strict or, in some cases more strict than the NAAQS. State standards prohibit any visible emissions of fugitive dust from construction activities at the property line.

Emissions relevant to livestock operation include particulate matter and fugitive dust. Greenhouse gases related to dairy cows include methane (CH_4) from enteric fermentation, and both methane and nitrous oxide (N_20) emissions from manure

application. No State or Federal regulations for greenhouse gas emissions from farm operations or small businesses currently exist.

DUST

Dust will be generated as cows move along soft limestone walkways that connect the paddocks and lead to and from the milking parlor. Potential fugitive dust emission rates were estimated from published literature, where particulate matter (PM) is measurable from the "drylots" of confined dairy operations where animals walk over dirt and dried manure throughout the day.

Applying the emission rates from this available literature greatly overestimates potential emission resulting from HDF. Cows in the pastoral rotational-grazing system will be on pasture 22 hours each day and will spend two hours – in two separate milking cycles –moving to and from the barn for the 10- to 15-minute milking sessions.

Using atmospheric dispersion modeling system (AERMOD), the rates were scaled to the size of the non-pasture areas used by cows at HDF. Results were added to the background concentration of particulate matter (both PM_{10} and $PM_{2.5}$) measured on the island of Kaua'i, and the total concentration was compared to the State ambient air quality standards. Only the contemplated herd size of up to 2,000 mature dairy cows was modeled, as at the lower threshold of 699 cows, the potential fugitive dust impact would be negligible. The estimated concentration for PM_{10} is 2.01 $\mu g/m^3$, well below the State standard of 150 $\mu g/m^3$. The estimated concentration for $PM_{2.5}$ is 0.23 $\mu g/m^3$, well below the Federal standard of 35 $\mu g/m^3$ (see Draft EIS Section 4.19 and Table 4-19.2).

ODOR

Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF, so air dispersion models were used to determine potential odor levels. Local weather data was used in conjunction with the AERMOD modeling system, and published rates for manure odors emissions for dairy heifers and effluent ponds were adapted to reflect the HDF facilities.

Odor emission sources identified for modeling at HDF were manure in the pasture fields, irrigation water containing diluted nutrients from effluent, the effluent storage ponds, and the dairy buildings. Odor rates from published research were applied. Odor isopleths (a line used to map all points having the same numerical value) were created to display the model findings. Odor is described in "odor units" at the threshold of perception, which is defined by the point at which 50 percent of panelists, in laboratory conditions, cannot smell the odor but 50 percent of the panelists can detect the odor.

Modeling results were generated for worst case meteorological conditions (low wind velocity / mixing). Generally, tradewinds will disperse odors to less than detectable levels beyond the HDF site; in periods of no wind, odor may not be

dispersed creating the "worst case" scenario. In these periods without normal tradewind flow, the odor plume would extend to the south of the HDF site. Sections 4.19.2 and 4.25.2 of the EIS include graphics of the potential odor isopleths.

Results for the committed herd size of 699 mature dairy cows show that odors may be detectable by 50 percent of the sensitive population once per 200 hours, or 44 hours per year, within an area that extends approximately 1,670-feet (within one-third of a mile) beyond the dairy farm boundary, and does not reach recreational or residential areas. Results for the contemplated expanded herd size of up to 2,000 mature dairy cows show odors would not extend beyond 2,780 feet outside the HDF boundary (just over half a mile), again not reaching recreational or residential areas, and again with detection limited to 50 percent of the sensitive population approximately 44 hours per year. The parameters used in the analysis were intentionally conservative, and the impacts shown assume an unlikely confluence of worst-case meteorological data, irrigation location, and grazing location. Actual offsite odor impacts are likely to be much lower and/or less frequent than shown; it is likely odor detection beyond the HDF boundaries will be less frequent.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

Feb 23, 2015
1902 Poipu RD. #232
Koloa, HI 96756

RECEIVED
FEB 24 2015
GROUP 70 INTL

Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, HI96813

Subject: HDF Dairy Farm on Koloa in the Maha'ulepu Area.

To whom it may concern:

I am opposed to the subject dairy farm due to its effect on air quality in the are in which live, namely the POIPU area south of Koloa. Because of my proximity to dairy farms where I have previously resided, I am acutely aware of the effect on air quality of effluent holding ponds on areas downwind from the farm. In the case of HDF, we are located directly downwind from this facility due to the prevailing trade winds common to this area. Regardless of the feeding process of this proposed dairy farm, the milking area generates large quantities of foul odor waste due to cattle elimination waste and the water used to remove it from the milking area.

Without highly effective water treatment facilities it will be impossible to control the odor emanating from this area. I question whether studies concerning the holding area for waste consider guarding against rains of the magnitude of those received by this area during March of 2006 amounting to approximately 40 inches for the month.

Your thoughtful consideration of these concerns will be greatly appreciated.

Sincerely yours,

Herbert F Herndon,
1901 Poipu RD #232
Koloa, HI 96756.

GROUP 70
INTERNATIONAL

May 26, 2016

Herb Herndon
1901 Poipu RD #232
Koloa, HI 96756
kahala232@aol.com

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Herb Herndon:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

NATURAL HAZARDS: The potential impacts of natural hazards are evaluated in the Draft Environmental Impact Statement (EIS), including flooding, tsunami, earthquakes, and hurricanes. Draft EIS Section 4.6 addresses natural hazards.

The Māhā'ulepū property is not known to experience flooding conditions. The area is located within Federal Emergency Management Agency (FEMA) Zone X, areas determined to be outside the 0.2% annual chance floodplain. The proposed location for Hawai'i Dairy Farms (HDF) lies between the 60 and 150 feet elevation, outside the tsunami evacuation zone. The Kaua'i and Ni'ihau region of the Hawaiian Islands has experienced tremors from earthquakes originating further south in the island chain, but no known seismic activity has originated among these northern islands.

Although they occur infrequently, Kaua'i has received a greater amount of damage from hurricanes when compared to the other Hawaiian Islands. Land management personnel in the Māhā'ulepū region during and following the hurricanes that affected Kaua'i in 1982 and 1992 observed defoliation of vegetation, and no flooding events in the period following passage of the storms.

Preparedness is the best protection for natural disasters. Structural design of dairy facilities will meet International Building Code (IBC) 2006 standards with local amendments. Provisions in design will address wind loading (including hurricane gusts), rain and flood loading, and earthquake loading. A geotechnical evaluation of the area recommended Seismic Site Class D under IBC standards be utilized for foundation design where the barns and agricultural infrastructure will be constructed.

There has been no rainfall event that would exceed the capacity of the effluent ponds since rainfall has been recorded in Māhā'ulepū Valley. The effluent pond capacity has been designed above the regulatory requirement to contain the 25-year, 24-hour rainfall event. An emergency containment berm with additional capacity for another 30 days is included in the design. This design exceeds regulatory requirements, with containment in excess of the major rainfall events recorded on Kaua'i over the past three decades.

An emergency preparedness plan for protection of animals has been prepared for HDF internal use that addresses hurricane, fire, and potential flooding hazard scenarios. HDF is not in a tsunami inundation area, so this scenario is not planned for in the disaster plan. The disaster plan relies upon knowledge of cow behavior, and is based on extensive guidance for livestock protection from NRCS, the Florida State Agricultural Response Team (SART), Pennsylvania State College of Agricultural Sciences, and Cornell University Cooperative Extension. The plan includes safety procedures during any disaster, follow up actions, and emergency contacts for assistance before, during or following the event. Further information is provided in the Draft EIS Section 4.6.2.

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area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

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Emissions relevant to livestock operation include particulate matter and fugitive dust. Greenhouse gases related to dairy cows include methane (CH_4) from enteric fermentation, and both methane and nitrous oxide (N_20) emissions from manure application. No State or Federal regulations for greenhouse gas emissions from farm operations or small businesses currently exist.

DUST

Dust will be generated as cows move along soft limestone walkways that connect the paddocks and lead to and from the milking parlor. Potential fugitive dust emission rates were estimated from published literature, where particulate matter (PM) is measurable from the "drylots" of confined dairy operations where animals walk over dirt and dried manure throughout the day.

Applying the emission rates from this available literature greatly overestimates potential emission resulting from HDF. Cows in the pastoral rotational-grazing system will be on pasture 22 hours each day and will spend two hours – in two separate milking cycles –moving to and from the barn for the 10- to 15-minute milking sessions.

Using atmospheric dispersion modeling system (AERMOD), the rates were scaled to the size of the non-pasture areas used by cows at HDF. Results were added to the background concentration of particulate matter (both PM_{10} and $PM_{2.5}$) measured on the island of Kaua'i, and the total concentration was compared to the State ambient air quality standards. Only the contemplated herd size of up to 2,000 mature dairy cows was modeled, as at the lower threshold of 699 cows, the potential fugitive dust impact would be negligible. The estimated concentration for PM_{10} is 2.01 $\mu g/m^3$, well below the State standard of 150 $\mu g/m^3$. The estimated concentration for $PM_{2.5}$ is 0.23 $\mu g/m^3$, well below the Federal standard of 35 $\mu g/m^3$ (see Draft EIS Section 4.19 and Table 4-19.2).

ODOR

Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF, so air dispersion models were used to determine potential odor levels. Local weather data was used in conjunction with the AERMOD modeling system, and published rates for manure odors emissions for dairy heifers and effluent ponds were adapted to reflect the HDF facilities.

Odor emission sources identified for modeling at HDF were manure in the pasture fields, irrigation water containing diluted nutrients from effluent, the effluent storage ponds, and the dairy buildings. Odor rates from published research were applied. Odor isopleths (a line used to map all points having the same numerical value) were created to display the model findings. Odor is described in "odor units" at the threshold of perception, which is defined by the point at which 50 percent of panelists, in laboratory conditions, cannot smell the odor but 50 percent of the panelists can detect the odor.

Modeling results were generated for worst case meteorological conditions (low wind velocity / mixing). Generally, tradewinds will disperse odors to less than detectable levels beyond the HDF site; in periods of no wind, odor may not be dispersed creating the "worst case" scenario. In these periods without normal tradewind flow, the odor plume would extend to the south of the HDF site. Sections 4.19.2 and 4.25.2 of the EIS include graphics of the potential odor isopleths.

Results for the committed herd size of 699 mature dairy cows show that odors may be detectable by 50 percent of the sensitive population once per 200 hours, or 44 hours per year, within an area that extends approximately 1,670-feet (within one-third of a mile) beyond the dairy farm boundary, and does not reach recreational or residential areas. Results for the contemplated expanded herd size of up to 2,000 mature dairy cows show odors would not extend beyond 2,780 feet outside the HDF boundary (just over half a mile), again not reaching recreational or residential areas, and again with detection limited to 50 percent of the sensitive population approximately 44 hours per year. The parameters used in the analysis were intentionally conservative, and the impacts shown assume an unlikely confluence of worst-case meteorological data, irrigation location, and grazing location. Actual offsite odor impacts are likely to be much lower and/or less frequent than shown; it is likely odor detection beyond the HDF boundaries will be less frequent.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

-----Original Message-----
From: JOYCE HERNDON [mailto:joycehern@gmail.com]
Sent: Monday, February 23, 2015 1:21 PM
To: EPO
Subject: HDF in Mahaulepu Area, Kauai

To whom it may concern:

I am opposed to the proposed dairy farm in the Mahaulepu Area, Kauai due to its effect on air quality in the area in which I live, the POIPU area south of Koloa. Because of my proximity to dairy farms where I have previously resided, I am acutely aware of the effect on air quality of effluent holding ponds on areas downwind from the farm. In the case of HDF, we are located directly downwind from this facility due to the prevailing trade winds common to this area. Regardless of the feeding process of this proposed dairy farm, the milking area generates large quantities foul odor waste due to cattle elimination waste and the water used to remove it from the milking area.

Without highly effective water treatment facilities it will be impossible to control the odor emitting from this area. I question whether studies concerning the holding area for waste consider guarding against rains of the magnitude of those received by this area during March of 2006, amounting to approximately 40 inches for the month.

Your thoughtful consideration of these concerns will be greatly appreciated.

Sincerely yours,

Joyce W. Herndon
1901 Poipu Rd. Apt. 232
Koloa, HI 96756

GROUP 70 INTERNATIONAL

May 26, 2016

Joyce Herndon
1901 Poipu Rd. Apt. 232
Koloa, HI 96756
joycehern@gmail.com

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Joyce Herndon:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

Your comments were received by the State of Hawai'i Department of Health Environmental Planning office. The Department of Health forwarded a copy of your comments to Group 70 International in order to be included in the Draft Environmental Impact Statement (EIS) analysis. This letter was prepared in response to your comments.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

NATURAL HAZARDS: The potential impacts of natural hazards are evaluated in the Draft Environmental Impact Statement (EIS), including flooding, tsunami, earthquakes, and hurricanes. Draft EIS Section 4.6 addresses natural hazards.

The Māhā'ulepū property is not known to experience flooding conditions. The area is located within Federal Emergency Management Agency (FEMA) Zone X, areas

determined to be outside the 0.2% annual chance floodplain. The proposed location for Hawai'i Dairy Farms (HDF) lies between the 60 and 150 feet elevation, outside the tsunami evacuation zone. The Kaua'i and Ni'ihau region of the Hawaiian Islands has experienced tremors from earthquakes originating further south in the island chain, but no known seismic activity has originated among these northern islands.

Although they occur infrequently, Kaua'i has received a greater amount of damage from hurricanes when compared to the other Hawaiian Islands. Land management personnel in the Māhā'ulepū region during and following the hurricanes that affected Kaua'i in 1982 and 1992 observed defoliation of vegetation, and no flooding events in the period following passage of the storms.

Preparedness is the best protection for natural disasters. Structural design of dairy facilities will meet International Building Code (IBC) 2006 standards with local amendments. Provisions in design will address wind loading (including hurricane gusts), rain and flood loading, and earthquake loading. A geotechnical evaluation of the area recommended Seismic Site Class D under IBC standards be utilized for foundation design where the barns and agricultural infrastructure will be constructed.

There has been no rainfall event that would exceed the capacity of the effluent ponds since rainfall has been recorded in Māhā'ulepū Valley. The effluent pond capacity has been designed above the regulatory requirement to contain the 25-year, 24-hour rainfall event. An emergency containment berm with additional capacity for another 30 days is included in the design. This design exceeds regulatory requirements, with containment in excess of the major rainfall events recorded on Kaua'i over the past three decades.

An emergency preparedness plan for protection of animals has been prepared for HDF internal use that addresses hurricane, fire, and potential flooding hazard scenarios. HDF is not in a tsunami inundation area, so this scenario is not planned for in the disaster plan. The disaster plan relies upon knowledge of cow behavior, and is based on extensive guidance for livestock protection from NRCS, the Florida State Agricultural Response Team (SART), Pennsylvania State College of Agricultural Sciences, and Cornell University Cooperative Extension. The plan includes safety procedures during any disaster, follow up actions, and emergency contacts for assistance before, during or following the event. Further information is provided in the Draft EIS Section 4.6.2.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhā'ulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhā'ulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Po'ipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhā'ulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawai'i Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhā'ulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhāʻulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhāʻulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kaua'i community.

Regional Water Demand: The adjacent, developed Kōloa-Po'ipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kaua'i will increase county-wide by 17,300 residents by 2030. The South Kaua'i population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kaua'i region (the Kōloa - Po'ipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhāʻulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhāʻulepū watershed.

The HDF site is located on the bottom-land of the upper Māhāʻulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Ha'upu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhāʻulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

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DUST

Dust will be generated as cows move along soft limestone walkways that connect the paddocks and lead to and from the milking parlor. Potential fugitive dust emission rates were estimated from published literature, where particulate matter (PM) is measurable from the "drylots" of confined dairy operations where animals walk over dirt and dried manure throughout the day.

Applying the emission rates from this available literature greatly overestimates potential emission resulting from HDF. Cows in the pastoral rotational-grazing system will be on pasture 22 hours each day and will spend two hours – in two separate milking cycles –moving to and from the barn for the 10- to 15-minute milking sessions.

Using atmospheric dispersion modeling system (AERMOD), the rates were scaled to the size of the non-pasture areas used by cows at HDF. Results were added to the background concentration of particulate matter (both PM_{10} and $PM_{2.5}$) measured on the island of Kaua'i, and the total concentration was compared to the State ambient air quality standards. Only the contemplated herd size of up to 2,000 mature dairy cows was modeled, as at the lower threshold of 699 cows, the potential fugitive dust impact would be negligible. The estimated concentration for PM_{10} is 2.01 $\mu g/m^3$, well below the State standard of 150 $\mu g/m^3$. The estimated concentration for $PM_{2.5}$ is 0.23 $\mu g/m^3$, well below the Federal standard of 35 $\mu g/m^3$ (see Draft EIS Section 4.19 and Table 4-19.2).

ODOR

Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF, so air dispersion models were used to determine potential odor levels. Local weather data was used in conjunction with the AERMOD modeling system, and published rates for manure odors emissions for dairy heifers and effluent ponds were adapted to reflect the HDF facilities.

Odor emission sources identified for modeling at HDF were manure in the pasture fields, irrigation water containing diluted nutrients from effluent, the effluent storage ponds, and the dairy buildings. Odor rates from published research were applied. Odor isopleths (a line used to map all points having the same numerical value) were created to display the model findings. Odor is described in "odor units" at the threshold of perception, which is defined by the point at which 50 percent of panelists, in laboratory conditions, cannot smell the odor but 50 percent of the panelists can detect the odor.

Modeling results were generated for worst case meteorological conditions (low wind velocity / mixing). Generally, tradewinds will disperse odors to less than detectable levels beyond the HDF site; in periods of no wind, odor may not be

dispersed creating the "worst case" scenario. In these periods without normal tradewind flow, the odor plume would extend to the south of the HDF site. Sections 4.19.2 and 4.25.2 of the EIS include graphics of the potential odor isopleths.

Results for the committed herd size of 699 mature dairy cows show that odors may be detectable by 50 percent of the sensitive population once per 200 hours, or 44 hours per year, within an area that extends approximately 1,670-feet (within one-third of a mile) beyond the dairy farm boundary, and does not reach recreational or residential areas. Results for the contemplated expanded herd size of up to 2,000 mature dairy cows show odors would not extend beyond 2,780 feet outside the HDF boundary (just over half a mile), again not reaching recreational or residential areas, and again with detection limited to 50 percent of the sensitive population approximately 44 hours per year. The parameters used in the analysis were intentionally conservative, and the impacts shown assume an unlikely confluence of worst-case meteorological data, irrigation location, and grazing location. Actual offsite odor impacts are likely to be much lower and/or less frequent than shown; it is likely odor detection beyond the HDF boundaries will be less frequent.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

Feb. 20, 2015

TO: Group 70 International
925 Bethel Street, 5th Floor
Honolulu, HI
96813

RECEIVED
FEB 23 2015
GROUP 70 INTL

Is Mahau'lepu a Particular* Landfill?

Prior to any approval from government agencies allowing the Mahau'lepu area to be used as a site for a possible health hazard / water polluting dairy farm, or any other agricultural endeavors, this Kaua'i resident recommends that an "independent civil investigation" be conducted concerning the possibility that environmental violations have occurred in the above mentioned area resulting in the creation of a clandestine "Solid Waste Disposal Facility"; commonly referred to as a "landfill".

Over the past decade and a half, both private (business) and public (government) sector's records indicate evidence that certain solid waste materials, namely Construction & Demolition debris (C&D) along with hazardous waste (asbestos & red lead paint), have been disposed of in un-supervised fashions.

Such acts of possible circumvention of legitimate, best industry practices, are considered crimes; both civil and criminal, and need to be clarified. Why add more possible pollutants to an area that may already be polluted? Let's find the truth.

Not only does it create the possibility of exposing the Poipu - Koloa - Mahau'lepu area residents, vacationers, businesses, schools ....our children.... to health and life threatening issues, such actions also deprives our County of Kaua'i much needed revenues generated from tipping fees which support our government and our island. ALOHA

John Hoff

* Def: "distinctive among others of the same general category"

GROUP 70 INTERNATIONAL

May 26, 2016

John R. Hoff
P.O. Box 547
Koloa, HI 96756

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear John R. Hoff:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

DAIRY OPERATIONS: Hawai'i Dairy Farms (HDF) will establish and operate a sustainable, pastoral rotational-grazing dairy farm in Māhā'ulepū Valley on the island of Kaua'i to produce fresh, locally available nutritious milk for Hawai'i families. The rotational-grazing method utilizes 100 percent of the cows' manure as natural fertilizer to grow pasture grass as a primary source of nutrition for dairy cows. This cost-effective method will reduce reliance on imported fertilizer and feed. Pasture grass will comprise at least 70 percent of the animals' diet. As a part of the Draft Environmental Impact Statement (EIS), the proposed facilities and operations for the dairy farm are described in Chapter 3.

The Environmental Impact Statement (EIS) Preparation Notice (EISPN), published January 23, 2015, described the proposed pasture-based rotational grazing system as a "zero-discharge, grass-fed dairy". The term "zero-discharge" under the U.S.

Environmental Protection Agency related to concentrated feeding operations (CAFO) is a system designed to not discharge pollutants into waters of the United States. As noted previously, the HDF system is designed to utilize 100 percent of the cows' manure on-site. However, nutrients would be introduced to the HDF site with any use; the Draft EIS identifies the amount of nutrients anticipated from the proposed dairy operations that could pass through to ground and surface waters. Therefore, HDF elected to discontinue use of the term "zero discharge" as it was construed as no nutrients into the system.

The term "grass-fed" was used in the HDF EISPN. This term was used to identify HDF's intent to utilize a locally-produced feedstock – grass – for more than 70 percent of the dairy herds' diet. In January 2016, the U.S. Department of Agricultural (USDA) Marketing Survey created a narrow legal definition of "grass-fed". The USDA standard defines what animals can and cannot be fed. The Food Alliance, a project of several northwest colleges, believes that when consumers choose grass-fed products there is an expectation that these will come from animals raised on pasture on a forage-based diet. Due to the evolving definition of "grass-fed", the term in not used in this EIS.

The dairy facilities will occupy an area of approximately 10 acres on the western boundary of the site. The developed area "footprint" will be less than 2 percent of the total farm area. Four buildings will be constructed to serve different functions, supported by utilities and infrastructure. Additional building information can be found in Draft EIS Section 3.3.1.

Agricultural infrastructure and utilities required for the dairy operations will include storage tanks and silos, effluent storage ponds, livestock water systems, and drainage improvements. The irrigation system and distribution of livestock water are discussed in Draft EIS Section 3.5, Pasture Management.

The pastoral rotational-grazing dairy provides a local feedstock – grass – as the herd's primary food source. Reducing imported feed stabilizes costs and provides a food source closer to the natural diet of cows. Results of grass trials initially conducted at five sites across four Hawaiian Islands were instrumental in identifying appropriate varieties of grass, and suitable sites to support sufficient "dry matter" grass yields essential to a cow's diet. Additional project-specific trials at the Māhāʻulepū site on Kauai have been conducted for more than 18 months. The results have identified sufficient yield and nutrition to supply 70 percent of the cows' diet; improvements in grass productivity are anticipated to provide up to 85 percent of cows' diet.

The pasture-based model allows cows to move about freely, and to lie down and rest, which is part of the digestion cycle. The animals are managed in social groups known as "mobs", mimicking the natural social order of bovines. Cows spend 22 hours of each 24-hour period foraging on pasture or resting, outdoors in natural light and fresh air. The gently sloped paddocks, walkways and races minimize the energy expended by the mature dairy cows as they graze or are transferred to and from the various paddocks and the mature dairy facility; surfaces of the walkways and cow races are designed to provide a comfortable path under hoof. The

management practices and pasture model applied by HDF maximizes grass as the cows' primary nutrition source and minimizes stress to the animals. Cows tend to be healthier and live longer, productive lives with access to fresh air, high quality feed, and exercise while they forage.

The 470 acres of pasture will be divided into paddocks averaging 3 to 5 acres in size. Smaller paddocks located near the dairy facility will be used as temporary pasture for cows or calves being moved on or off the farm. To protect the water quality of surface water and downstream areas, paddock fences are set back 35 feet from the edge of drainage ways throughout the site. Existing vegetation within the setbacks will be managed or restored to reduce erosion, improve stability of ditch banks, increase net carbon storage, and improve and maintain water quality.

The majority of the pastures will be irrigated with non-potable water and/or diluted effluent through either the pivot irrigation systems or through gun irrigators. Irrigation water supply is provided to the farm from Waita Reservoir, and will be filtered and pumped to the various irrigation components on the farm. The irrigation system is controlled using computer software and GPS receivers to allow very precise application of irrigation and/or diluted effluent on the pasture. The pivots can rotate and apply irrigation water and/or diluted effluent at different rates depending on the actual irrigation needs of the farm.

NRCS provides technical guidance on applying agricultural waste depending on the desired use of the waste. Reflected in the title of the livestock waste guidance for Hawaiʻi is the parenthetical inclusion of the word "nutrients." Where waste is utilized as a resource, it is being used for the constituent components that provide benefit.

The NRCS Conservation Practice Standard 590, Nutrient Management, applies to commercial fertilizers, organic by-products, waste water, organic matter, and irrigation water. Nutrient management is the practice of managing the amount, rate, source, method of application, and timing of plant nutrients and soil amendments. The timing and application of nutrients will correspond with plant uptake, soil properties and weather conditions. For more information on nutrient balance management see Draft EIS Section 3.5.3, and Draft EIS Appendix D.

The effluent storage ponds are sized to accommodate 30 days of storage for up to 2,000 mature dairy cows, and over 85 days of storage for 699 mature dairy cows. It will be highly unlikely that the storage pond will be full at any time for the contemplated 2,000-cow dairy, and nearly impossible for the committed 699-cow dairy. Throughout the less than 30-day storage period, effluent is planned for application every four days, and the slurry application is expected at least once every 45 days, to ensure that the ponds are kept at manageable levels.

Cows lactate milk following the birth of calves. Newborn calves will be housed on the Māhāʻulepū site and provided essential colostrum and nutrients for a healthy start. During the calves' initial 90 days, they will be transitioned to pasture at HDF before transfer to ranches on Kauaʻi to be raised off-site. The committed herd size of 699 mature dairy cows at the Māhāʻulepū site applies to mature mature dairy cows.

Animals in various stages of lactation and rest will be transferred between HDF and other partner ranches as needed for animal health and dairy productivity. This will benefit both the dairy and infuse the beef market in Hawai'i with a new, local source of pasture-raised calves. Male calves will become part of the beef cattle herd; heifers (young female calves that haven't given birth) will be raised until ready to return to the HDF herd as a birthing/mature dairy cow. For more information on off-site herd management, refer to Section 3.7 of the Draft EIS.

Health of the herd is of primary importance as the success of a dairy relies on cows effectively producing quality milk. All cows will be treated with a high standard of care. Dairy managers and caretakers will be trained and competent in handling animals to minimize stress and ensure the herds' welfare. A licensed veterinarian may prescribe use of antibiotics approved by the Food & Drug Administration (FDA) for treatment of illnesses. Adherence to guidelines that prohibit milk from cows undergoing antibiotic treatment will ensure no adulteration of milk. Routine laboratory tests of milk for traces of antibiotic residue will be conducted. HDF will not inject cows with bovine growth hormone, referred to as rBST or rBGH.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhā'ulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhā'ulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of

soils in the adjacent Kōloa-Po'ipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhā'ulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawai'i Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhā'ulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhā'ulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhā'ulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kaua'i community.

Regional Water Demand: The adjacent, developed Kōloa-Po'ipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kaua'i will increase county-wide by 17,300 residents by 2030. The South Kaua'i population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kaua'i region (the Kōloa - Po'ipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhā'ulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhā'ulepū watershed.

The HDF site is located on the bottom-land of the upper Māhā'ulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Ha'upu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhā'ulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kaua'i Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore

recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhā'ulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhā'ulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhā'ulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to

increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhā'ulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Po'ipū region were also calculated. Nitrogen input to the marine environment in the Po'ipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Po'ipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kaua'i community.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

RECEIVED

FEB 13 2015

GROUP 70 INTL

February 12, 2015

Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, HI 96813

To Whom It May Concern:

My name is Maureen Holt. My husband Howard and I founded Trustile Doors Inc. in Denver Colorado in 1995. Trustile is an MDF door manufacturer. MDF is a product made from wood dust and compressed into sheets that are cut and styled into doors. It is an environmentally green product. We built a state of the art 50,000 square foot plant and we burned our waste to create the energy we needed to run our equipment. The air quality leaving our plant was actually cleaner than the air coming into our facility. We provided a safe workplace and created 168 American jobs. We sold our company and in 2006 we moved to Kauai.

We had vacationed in Kauai 7 different times before the actual move. We loved Kauai for its weather, natural beauty, and its life style. We purchased a home in Koloa Estates on the South Shore of Kauai near the world famous Poipu Beach. The air and water quality are much better here than that of the mainland Howard breathes easier here and doesn't have to take as much medication for his Asthma. The warm weather is easier on me with my arthritis and lower back pain. It is a great place to live. We spend most of our time outdoors while our friends and family on the mainland have to live indoors during the cold winters.

We are extremely concerned about an industrial sized dairy coming to our island. On the mainland dairies are usually located off busy highways on huge parcels of land away from housing developments and pristine coastlines. We have driven by dairy farms and had to hold our breath due to the odor caused. Dairies are notorious for bringing in flies. One expert that happens to live on the north shore of Kauai stated there would be one billion flies. The odor and the flies would ruin our quality of life here. We like to eat outside, enjoy swimming in our pool, gardening and playing Frisbee with our labradoodle Rosie. We will have to invest in expensive air conditioning instead of enjoying the cool trade winds and shut our windows to avoid the odor and the constant buzzing and biting flies. It is estimated that our property values could drop as much as 40% which would affect the property tax revenue base for the county. Our house is paid in full and we would have to walk away from our investment, most people have loans and would walk away from what they paid leaving the bank their home.

The dairy is only going to create 15 jobs and it has the potential to completely destroy tourism on our beautiful South Shore. Tourists are not going to spend all the money it takes to get here to smell cow dung and swat flies. The amount of jobs lost if tourism drops could be in the thousands. Kauai depends on tourism for its sustainability. The Grand Hyatt hotel has filed a lawsuit against the dairy. The Hyatt has already lost business since conventions are booked years in advance and just the idea of an industrial sized dairy coming in such close proximity to the Hyatt has caused businesses to find other locations for their conventions. The Hyatt was planning to expand its location to add more hotel rooms to the south shore which would create more jobs for the largest employer on the island. The Hyatt is a good steward of the land and keeps the grounds very pristine and welcoming, and is an excellent company to work for. Our son works for the Hyatt in Beaver Creek Co. and he loves his job.

The Hawaiian people want to be good stewards of the land their "aina, honua" and keep it for future generations. There are several significant sites that are considered sacred and need to be undisturbed by the dairy. The waste caused from the dairy could destroy already endangered plants, birds, coral and several species of ocean life.

We are concerned about the dairy location only 750 feet from our wells for our drinking water. We feel the amount of waste generated by the industrial dairy will make our drinking water unsafe, due to the large amount of urine and manure left on the grazing land.

The dairy is modeled after dairies in New Zealand and we just need to look to what has happened there and realize this is not right for Kauai. The beaches there are not black sand they are black from manure deposits with swimming and fishing becoming a thing of the past.

Dr. Carl Berg of Surf Rider has tested the water quality and it is already polluted with human and animal waste and the Department of Health agrees with their findings. We need to find the sources of the pollutants and see that Steve Case the owner Grove Farm cleans up the water prior to a dairy being established on the site. The Friends of Maha'ulepu offered to put up signs on the beaches to discourage swimming in the polluted water and Grove Farm refused to post the signs. They don't want to discourage tourism, however there is a health risk associated with swimming in the polluted water.

We believe in the American dream and Peter Omidyar created a great thing with EBAY. We as previous business owners commend him on his success; however leasing the land from Grove Farm to build and industrial sized dairy is a really bad idea for Kauai. Peter needs to create jobs at the same time take care of the environment and not affect surrounding communities. His legacy should be to improve the quality of life here on the island.

We want to trust that our government officials will protect us against the damaging effects this dairy will cause our island. We believe the Environmental Impact Study will prove that this site is unsuitable for and industrial sized dairy. We are so blessed to live in such a desirable place, let's keep it that way for future generations.

Sincerely,

Howard F & Maureen C. Holt
3051 Pua Akala Place
Koloa, Hi 96756

May 26, 2016

Howard & Maureen Holt
3051 Pua Akala Place
Koloa, HI 96756
hholt@hawaii.rr.com

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Howard & Maureen Holt:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

DAIRY OPERATIONS: Hawai'i Dairy Farms (HDF) will establish and operate a sustainable, pastoral rotational-grazing dairy farm in Māhā'ulepū Valley on the island of Kaua'i to produce fresh, locally available nutritious milk for Hawai'i families. The rotational-grazing method utilizes 100 percent of the cows' manure as natural fertilizer to grow pasture grass as a primary source of nutrition for dairy cows. This cost-effective method will reduce reliance on imported fertilizer and feed. Pasture grass will comprise at least 70 percent of the animals' diet. As a part of the Draft Environmental Impact Statement (EIS), the proposed facilities and operations for the dairy farm are described in Chapter 3.

The Environmental Impact Statement (EIS) Preparation Notice (EISPN), published January 23, 2015, described the proposed pasture-based rotational grazing system

as a "zero-discharge, grass-fed dairy". The term "zero-discharge" under the U.S. Environmental Protection Agency related to concentrated feeding operations (CAFO) is a system designed to not discharge pollutants into waters of the United States. As noted previously, the HDF system is designed to utilize 100 percent of the cows' manure on-site. However, nutrients would be introduced to the HDF site with any use; the Draft EIS identifies the amount of nutrients anticipated from the proposed dairy operations that could pass through to ground and surface waters. Therefore, HDF elected to discontinue use of the term "zero discharge" as it was construed as no nutrients into the system.

The term "grass-fed" was used in the HDF EISPN. This term was used to identify HDF's intent to utilize a locally-produced feedstock – grass – for more than 70 percent of the dairy herds' diet. In January 2016, the U.S. Department of Agricultural (USDA) Marketing Survey created a narrow legal definition of "grass-fed". The USDA standard defines what animals can and cannot be fed. The Food Alliance, a project of several northwest colleges, believes that when consumers choose grass-fed products there is an expectation that these will come from animals raised on pasture on a forage-based diet. Due to the evolving definition of "grass-fed", the term in not used in this EIS.

The dairy facilities will occupy an area of approximately 10 acres on the western boundary of the site. The developed area "footprint" will be less than 2 percent of the total farm area. Four buildings will be constructed to serve different functions, supported by utilities and infrastructure. Additional building information can be found in Draft EIS Section 3.3.1.

Agricultural infrastructure and utilities required for the dairy operations will include storage tanks and silos, effluent storage ponds, livestock water systems, and drainage improvements. The irrigation system and distribution of livestock water are discussed in Draft EIS Section 3.5, Pasture Management.

The pastoral rotational-grazing dairy provides a local feedstock – grass – as the herd's primary food source. Reducing imported feed stabilizes costs and provides a food source closer to the natural diet of cows. Results of grass trials initially conducted at five sites across four Hawaiian Islands were instrumental in identifying appropriate varieties of grass, and suitable sites to support sufficient "dry matter" grass yields essential to a cow's diet. Additional project-specific trials at the Māhā'ulepū site on Kauai have been conducted for more than 18 months. The results have identified sufficient yield and nutrition to supply 70 percent of the cows' diet; improvements in grass productivity are anticipated to provide up to 85 percent of cows' diet.

The pasture-based model allows cows to move about freely, and to lie down and rest, which is part of the digestion cycle. The animals are managed in social groups known as "mobs", mimicking the natural social order of bovines. Cows spend 22 hours of each 24-hour period foraging on pasture or resting, outdoors in natural light and fresh air. The gently sloped paddocks, walkways and races minimize the energy expended by the mature dairy cows as they graze or are transferred to and from the various paddocks and the mature dairy facility; surfaces of the walkways

and cow races are designed to provide a comfortable path under hoof. The management practices and pasture model applied by HDF maximizes grass as the cows' primary nutrition source and minimizes stress to the animals. Cows tend to be healthier and live longer, productive lives with access to fresh air, high quality feed, and exercise while they forage.

The 470 acres of pasture will be divided into paddocks averaging 3 to 5 acres in size. Smaller paddocks located near the dairy facility will be used as temporary pasture for cows or calves being moved on or off the farm. To protect the water quality of surface water and downstream areas, paddock fences are set back 35 feet from the edge of drainage ways throughout the site. Existing vegetation within the setbacks will be managed or restored to reduce erosion, improve stability of ditch banks, increase net carbon storage, and improve and maintain water quality.

The majority of the pastures will be irrigated with non-potable water and/or diluted effluent through either the pivot irrigation systems or through gun irrigators. Irrigation water supply is provided to the farm from Waita Reservoir, and will be filtered and pumped to the various irrigation components on the farm. The irrigation system is controlled using computer software and GPS receivers to allow very precise application of irrigation and/or diluted effluent on the pasture. The pivots can rotate and apply irrigation water and/or diluted effluent at different rates depending on the actual irrigation needs of the farm.

NRCS provides technical guidance on applying agricultural waste depending on the desired use of the waste. Reflected in the title of the livestock waste guidance for Hawai'i is the parenthetical inclusion of the word "nutrients." Where waste is utilized as a resource, it is being used for the constituent components that provide benefit.

The NRCS Conservation Practice Standard 590, Nutrient Management, applies to commercial fertilizers, organic by-products, waste water, organic matter, and irrigation water. Nutrient management is the practice of managing the amount, rate, source, method of application, and timing of plant nutrients and soil amendments. The timing and application of nutrients will correspond with plant uptake, soil properties and weather conditions. For more information on nutrient balance management see Draft EIS Section 3.5.3, and Draft EIS Appendix D.

The effluent storage ponds are sized to accommodate 30 days of storage for up to 2,000 mature dairy cows, and over 85 days of storage for 699 mature dairy cows. It will be highly unlikely that the storage pond will be full at any time for the contemplated 2,000-cow dairy, and nearly impossible for the committed 699-cow dairy. Throughout the less than 30-day storage period, effluent is planned for application every four days, and the slurry application is expected at least once every 45 days, to ensure that the ponds are kept at manageable levels.

Cows lactate milk following the birth of calves. Newborn calves will be housed on the Māhā'ulepū site and provided essential colostrum and nutrients for a healthy start. During the calves' initial 90 days, they will be transitioned to pasture at HDF before transfer to ranches on Kaua'i to be raised off-site. The committed herd size of

699 mature dairy cows at the Māhā'ulepū site applies to mature mature dairy cows. Animals in various stages of lactation and rest will be transferred between HDF and other partner ranches as needed for animal health and dairy productivity. This will benefit both the dairy and infuse the beef market in Hawai'i with a new, local source of pasture-raised calves. Male calves will become part of the beef cattle herd; heifers (young female calves that haven't given birth) will be raised until ready to return to the HDF herd as a birthing/mature dairy cow. For more information on off-site herd management, refer to Section 3.7 of the Draft EIS.

Health of the herd is of primary importance as the success of a dairy relies on cows effectively producing quality milk. All cows will be treated with a high standard of care. Dairy managers and caretakers will be trained and competent in handling animals to minimize stress and ensure the herds' welfare. A licensed veterinarian may prescribe use of antibiotics approved by the Food & Drug Administration (FDA) for treatment of illnesses. Adherence to guidelines that prohibit milk from cows undergoing antibiotic treatment will ensure no adulteration of milk. Routine laboratory tests of milk for traces of antibiotic residue will be conducted. HDF will not inject cows with bovine growth hormone, referred to as rBST or rBGH.

ARCHAEOLOGICAL AND CULTURAL: The Hawai'i Dairy Farms (HDF) project is subject to a historic preservation review by the State Department of Land and Natural Resources, State Historic Preservation Division (SHPD) under HRS Chapter 6E and Chapter 13-284. An Archaeological Inventory Survey (AIS) and a Cultural Impact Assessment (CIA) were conducted by Scientific Consultant Services (SCS) for the proposed project. EIS Sections 4.7 and 4.8 provide an evaluation of archaeology and cultural resources, with technical studies in Appendix G and H.

A total of sixteen historic properties were identified through a pedestrian survey of the project area and an extended survey area of 100 meters of the northern boundary. Six historic-era sites occur in the project area and 10 sites occur in the extended survey area. Only one of the sites is believed to be associated with pre-Contact and/or early historic times. State Site 50-30-10-2250, the agricultural heiau, and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area. The remaining sites consist of historic-era bridges, ditches, culverts, retaining walls, and a flume system dating from the 20th century and are affiliated with sugarcane cultivation.

That a majority of the documented sites are related to the historic-era is not surprising, given the massive landscape modifications that occurred during intensive sugarcane cultivation on the valley floor. Even historic era cultural materials associated with the many Land Commission Awards in the project area were non-existent, as explored through survey and subsurface exploration.

The sixteen historic properties have been assessed for significance by the archaeological consultant and the dairy project is anticipated to have no impact on these sites. No further archaeological work is recommended for the sites. Two of the sixteen sites are considered significant under multiple criteria, but occur outside the project area on lands owned by a different landowner. Both sites will not be adversely affected by the proposed dairy project. No site is related to burials, and no bonex

were found. Such sites have been reported along coastal areas in sand dunes.

The cultural assessment examined the potential effect of the project on cultural resources, practices or beliefs, its potential to isolate cultural resources, practices or beliefs from their setting, and the potential of the project to introduce elements which may alter the setting in which cultural practices take place. Information received from the community indicates the Māhāʻulepū Ahupuaʻa, has been and is currently used for traditional cultural purposes. However, the dairy project area has not been included in these activities. It is clear that the gathered plants, trails, State Site 50-30-10-2250, the agricultural heiau, and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area.

The project will be fully enclosed by perimeter fencing along the boundary of the leased premises, which will ensure that project activities and any related impacts are contained within the project area. Based on the research and comments received from the community, it is reasonable to conclude that, pursuant to Act 50, the exercise of native Hawaiian rights or any ethnic group related to numerous traditional cultural practices will not be impacted by establishment of the dairy.

FLORA AND FAUNA: Botanical, avian, and mammalian surveys of the property were conducted for the Draft Environmental Impact Statement (EIS) to assess existing species on site, including identifying any species listed as endangered, threatened, or proposed under any state or federal endangered species programs in or near the property. EIS Sections 4.9 and 4.10 address the evaluation of flora and fauna resources, with technical studies in Appendix A and B.

A botanical survey of the dairy property was conducted in August 2014 by AECOS Consulting to assess existing plant species. The survey also investigated for the presence of plants currently listed as endangered, threatened or proposed for listing under Federal or the State of Hawaiʻiʻs endangered species programs, located onsite or within the immediate vicinity of the dairy site. The nature of the land and its present and historical uses for intensive agriculture very much limit the natural botanical resources anticipated to occur on this land. Complete species lists are included in the EIS, and no protected botanical species occur on the project property. The project will include vegetated buffer strips along the drainage ways as part of the Conservation Plan to reduce erosion and stabilize slopes. Where native plants occur or could survive if planted, native plants will be used in the stabilization. No long-term impacts to native plant habitats or endangered or threatened plants species will occur as a result of the dairy.

Avian and mammalian surveys were conducted in August 2014 by Rana Biological Consulting, Inc. This survey was conducted to assess the potential presence of avian or mammalian species currently listed as endangered, threatened or proposed for listing under either Federal or the State endangered species lists. The survey covered the dairy site area and immediate vicinity. Common birds and terrestrial mammals were encountered on the property. There is no critical habitat for endangered species in the upper Māhāʻulepū Valley.

Four species of endangered waterbirds were recorded on the site and at the nearby taro farm located within the HDF site. Though the area does not provide critical habitat, seabirds that nest in upland areas of Kauai may overfly the site. The endangered Hawaiian goose, nēnē was also seen on the site. State Division of Forestry and Wildlife biologists have noted nēnē are regularly seen on the subject property. It is probable that some nest on or adjacent to the site as this species nests in the general Kōloa area, and the habitat present on parts of the site is suitable for nēnē nesting.

The principal potential impacts posed to the five endangered species include those potentially associated with construction activities, and those associated with dairy farm operations following build-out. Measures will be adopted to avoid potential seabird and nēnē goose collisions with fences and structures. Potential measures include lowering construction cranes at night, using conservation fencing to project-specified areas, marking tall structures and fencing with white visibility polytape, limiting nighttime lighting, and shading any outside lights used at night. Ongoing mitigation strategies will be implemented for day-to-day preventative measures, including an Avian Species Protection Plan. Mitigation measures are further described in DEIS Section 4.10.2.

It is also likely that Hawaiian hoary bats overfly the project area on a seasonal basis. While caution will be taken during any potential disturbance or vegetation removal, there are almost no suitable roost trees within the dairy site, thus it is expected that the dairy farm will not affect this listed mammalian species.

PESTS: A study of invertebrate species and pest insects was conducted by Steven Lee Montgomery, PhD, Consulting Biologist in January 2016. The study summarizes the presence or absence of native species or pest species associated with cattle manure in the general Māhāʻulepū area, as well as the parasites and predators that control those species. No federally or state listed endangered or threatened invertebrate species were noted in the survey of the site. A full report and list of species found on site is provided in EIS Section 4.11 and Appendix B.

Flies were identified on the HDF site using manure from neighboring livestock as bait for invertebrates. The two flies associated with livestock are the stable fly and the horn fly, the latter known for biting cattle. These flies and the greenbottle fly are often confused with the house fly. Flies known to exist on Kauaʻi but not seen at the HDF site include the house fly, the dog dung fly, and the chicken dung fly. These pests are common in areas with high pet populations. It is possible these fly species could inadvertently be brought to the dairy and utilize manure as a food source. HDF will prevent and control fly population growth through diligent clean up and sanitation practices regarding any trash and food waste, as well as through efficient manure composting practices. A full list of site management measures is provided in EIS Section 4.11. The project location does not provide any habitat for *drosophila musaphilia*, the only Kauaʻi species of native Hawaiian fly listed as Endangered or Threatened. Native Drosophila habitat is located many miles away in the high elevation koa-ʻōhiʻa forests.

Fly populations at HDF will be minimized through a process known as Integrated Pest Management (IPM). Essentially, IPM disrupts reproduction with appropriate means at key points in the pest's life cycle. Used in Hawai'i for decades, a number of invertebrates and a bird (the cattle egret) were introduced between 1898 and 1950 to reduce livestock-related insects. IPM utilizes knowledge of the ancient food web among species.

An especially important insect to minimize fly breeding habitat in manure is the dung beetle, which buries manure and incorporates it into the soil. Populations of dung beetles found on Kaua'i and those species already in Māhā'ulepū Valley, will increase with the increased manure food source, thus increasing and speeding breakdown of manure. Dung beetles are specialists in the very important natural process of breaking up and quickly recycling bovine manure pads. The behavioral diversity among dung beetle species will work together to bury dung pats in one to three days, a shorter amount of time than the 10-30 days flies eggs need to hatch.

In the Kōloa-Poi'pū region, pest fly populations are dependent upon food and breeding sources nearby such as dog, cat, and chicken feces. Beef cattle graze in the region on agricultural lands along Ala Kinoiki Road between Kōloa and Poi'pū, and it is likely the livestock-related flies identified at the HDF site occur in this region as well. Localized controls to reduce pest populations need to address breeding sites in and amongst the food and animals wastes within the area. These mitigation measures will make it difficult for flies to breed, and BMPs will be enforced to address any increase in population, therefore it is expected that the dairy farm will not significantly affect recreational and resort areas.

DEMOGRAPHIC AND ECONOMIC: The potential impacts of Hawai'i Dairy Farms (HDF) to the existing economy were evaluated in the Draft Environmental Impact Statement (EIS), including a fiscal impact assessment report completed in April, 2016 by Plasch Economics Pacific. Draft EIS Section 4.15 addresses demographic and economic factors, with the complete report in Appendix J.

The HDF project would create short-term benefits through jobs for local construction personnel and local material suppliers. Such jobs would include equipment operators, cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, supervisors, painters, etc. Based on State employment multipliers, indirect employment related to Dairy construction would be expected to average about 16 jobs on Kaua'i, and 8 on O'ahu. Construction employment would be expected to average about 12 jobs per year during the development period. Thus direct-plus-indirect employment association with construction would be expected to average approximately 36 jobs, of which 28 would be on Kaua'i.

The HDF project would contribute to diversification of Kaua'i's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Hawai'i Island), approximately10 percent of Hawai'i's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of

milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and indirect full-time equivalent jobs on Kaua'i, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on O'ahu.

HDF is expected to generate a net income of approximately $68,000 to the County when the 699 cow herd is established. When the dairy has matured to full production for the 699 cow dairy, net income to the State is calculated at $160,000 annually. With the potential contemplated herd size of up to 2,000 mature dairy cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be produced. This would double local milk production currently supplied by operational dairies on the Island of Hawai'i.

Additional employment generated by a possible expansion to accommodate the contemplated 2,000 mature dairy cow herd is estimated at approximately 3 construction jobs plus 4 indirect jobs on Kaua'i, and 2 indirect jobs on O'ahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an additional 5 full-time farm jobs would be added, with approximately 15 additional indirect jobs on Kaua'i and another 8 indirect jobs on O'ahu.

The dairy is expected to generate a net additional contribution to the County of approximately $8,000 for improvements related to expansion for the contemplated herd size of up to 2,000 mature dairy cows ($76,000 total versus $68,000 for the committed herd size). The State will derive approximately $360,000 annually in revenues from the contemplated 2,000-mature dairy cow dairy.

Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhā'ulepū Valley floor is filled with

alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhāʻulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Poʻipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhāʻulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawaiʻi Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhāʻulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhāʻulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhāʻulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kauaʻi community.

Regional Water Demand: The adjacent, developed Kōloa-Poʻipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kauaʻi will increase county-wide by 17,300 residents by 2030. The South Kauaʻi population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kauaʻi region (the Kōloa - Poʻipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhāʻulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhāʻulepū watershed.

The HDF site is located on the bottom-land of the upper Māhāʻulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Haʻupu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhāʻulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction

Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kaua'i Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhā'ulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhā'ulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhā'ulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways;

only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhā'ulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Po'ipū region were also calculated. Nitrogen input to the marine environment in the Po'ipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Po'ipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal

area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kaua'i community.

AIR QUALITY: As a part of the Environmental Impact Statement (EIS), existing air quality conditions and project impacts were evaluated, including dust and odor. Potential odors and emission levels for air pollutants relevant to dairy operations were modeled, as currently there are no cows on site. EIS sections 4.19 and 4.25 provide an evaluation of air quality and odors, including a windrose depicting wind speed and direction in the area (see DEIS Section 4.1, Climate). The full air quality technical report can be found in Draft EIS Appendix I.

Clean Air Act

Under the *Clean Air Act of 1970* (CAA), amended November 1990, the U.S. Environmental Protection Agency (EPA) regulates both large and small sources of air pollutants by establishing National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. The State of Hawai'i has established its own *State Ambient Air Quality Standards* (SAAQS) that are as strict or, in some cases more strict than the NAAQS. State standards prohibit any visible emissions of fugitive dust from construction activities at the property line.

Emissions relevant to livestock operation include particulate matter and fugitive dust. Greenhouse gases related to dairy cows include methane (CH_4) from enteric fermentation, and both methane and nitrous oxide (N_20) emissions from manure application. No State or Federal regulations for greenhouse gas emissions from farm operations or small businesses currently exist.

DUST

Dust will be generated as cows move along soft limestone walkways that connect the paddocks and lead to and from the milking parlor. Potential fugitive dust emission rates were estimated from published literature, where particulate matter (PM) is measurable from the "drylots" of confined dairy operations where animals walk over dirt and dried manure throughout the day.

Applying the emission rates from this available literature greatly overestimates potential emission resulting from HDF. Cows in the pastoral rotational-grazing system will be on pasture 22 hours each day and will spend two hours – in two separate milking cycles –moving to and from the barn for the 10- to 15-minute milking sessions.

Using atmospheric dispersion modeling system (AERMOD), the rates were scaled to the size of the non-pasture areas used by cows at HDF. Results were added to the background concentration of particulate matter (both PM_{10} and $PM_{2.5}$) measured on the island of Kaua'i, and the total concentration was compared to the State ambient air quality standards. Only the contemplated herd size of up to 2,000 mature dairy cows was modeled, as at the lower threshold of 699 cows, the potential fugitive dust impact would be negligible. The estimated concentration for PM_{10} is 2.01 $\mu g/m^3$, well below the State standard of 150 $\mu g/m^3$. The estimated concentration for $PM_{2.5}$ is 0.23 $\mu g/m^3$, well below the Federal standard of 35 $\mu g/m^3$ (see Draft EIS Section 4.19 and Table 4-19.2).

ODOR

Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF, so air dispersion models were used to determine potential odor levels. Local weather data was used in conjunction with the AERMOD modeling system, and published rates for manure odors emissions for dairy heifers and effluent ponds were adapted to reflect the HDF facilities.

Odor emission sources identified for modeling at HDF were manure in the pasture fields, irrigation water containing diluted nutrients from effluent, the effluent storage ponds, and the dairy buildings. Odor rates from published research were applied. Odor isopleths (a line used to map all points having the same numerical value) were created to display the model findings. Odor is described in "odor units" at the threshold of perception, which is defined by the point at which 50 percent of panelists, in laboratory conditions, cannot smell the odor but 50 percent of the panelists can detect the odor.

Modeling results were generated for worst case meteorological conditions (low wind velocity / mixing). Generally, tradewinds will disperse odors to less than detectable levels beyond the HDF site; in periods of no wind, odor may not be dispersed creating the "worst case" scenario. In these periods without normal tradewind flow, the odor plume would extend to the south of the HDF site. Sections 4.19.2 and 4.25.2 of the EIS include graphics of the potential odor isopleths.

Results for the committed herd size of 699 mature dairy cows show that odors may be detectable by 50 percent of the sensitive population once per 200 hours, or 44 hours per year, within an area that extends approximately 1,670-feet (within one-third of a mile) beyond the dairy farm boundary, and does not reach recreational or residential areas. Results for the contemplated expanded herd size of up to 2,000 mature dairy cows show odors would not extend beyond 2,780 feet outside the HDF boundary (just over half a mile), again not reaching recreational or residential areas, and again with detection limited to 50 percent of the sensitive population approximately 44 hours per year. The parameters used in the analysis were intentionally conservative, and the impacts shown assume an unlikely confluence of worst-case meteorological data, irrigation location, and grazing location. Actual offsite odor impacts are likely to be much lower and/or less frequent than shown; it is likely odor detection beyond the HDF boundaries will be less frequent.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

From: jghouby@gmail.com
Sent: Saturday, February 21, 2015 5:20 PM
To: HDF
Subject: Hawaii Dairy Farms

Dear Sir
I am a property owner in the Poipu, Kauai area and am concerned about, and opposed to, the proposed dairy farm at Mahaulepu. I was unable to attend the HDF meeting in Koloa Thursday but read the covering article in the Garden Island newspaper today which included a statement by Jeff Overton of Group 70 International. The statement " This project is really about food sustainability..." puts in doubt the objectivity of any EIS conducted by Group 70 International. The EIS is really about the environment, not food sustainability! I have visited friends in Lynden and Carnation, Washington and I can assure you the aroma is not pleasant for miles around, as well as whatever other negative environmental impact may be present. I am in hope that after the year involved in preparing the EIS, you too will feel this is an ill advised project

Thank you
Jens Houby
1901 Poipu Rd. #611
Koloa, HI 96756

May 26, 2016

Jens Houby
1901 Poipu Rd. #611
Koloa, HI 96756
jghouby@gmail.com

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Jens Houby:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

GROUP 70 OBJECTIVITY: Group 70 International, Inc. (Group 70) is responsible for the preparation and processing of the Hawai'i Dairy Farms Environmental Impact Statement (EIS). The EIS was prepared in accordance with the requirements of Chapter 343 Hawai'i Revised Statutes and the "Environmental Impact Statement Rules" (Chapter 200 of Title 11, Hawai'i Administrative Rules). The environmental planning team at Group 70 has prepared several hundred Environmental Assessment and EIS documents over the past 40 years, and every document has been accepted by the responsible County, State and Federal agency. On numerous past EIS projects, the Hawai'i Chapter of the American Planning Association has recognized Group 70's professional work with Chapter awards for excellence in environmental planning. Part of the EIS scoping process involves Group 70's

experienced team of technical sub consultants that are well-known and qualified in their respective fields of study. For this project, Group 70 is preparing the Hawai'i Dairy Farms EIS with the level of analysis required to properly evaluate and disclose the existing environmental conditions, probable impacts with mitigation, and potential cumulative and secondary effects.

AIR QUALITY: As a part of the Environmental Impact Statement (EIS), existing air quality conditions and project impacts were evaluated, including dust and odor. Potential odors and emission levels for air pollutants relevant to dairy operations were modeled, as currently there are no cows on site. EIS sections 4.19 and 4.25 provide an evaluation of air quality and odors, including a windrose depicting wind speed and direction in the area (see DEIS Section 4.1, Climate). The full air quality technical report can be found in Draft EIS Appendix I.

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Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

RECEIVED

FEB 12 2015

GROUP 70 INTL

February 10, 2015

Group 70 International, Inc.
925 Bethel Street, Fifth Floor
Honolulu, Hawaii 96813
Jeff Overton, Principal Planner

Re: Hawaii Dairy Farms Environmental Impact Statement

Dear Mr. Overton,

My wife and I reside in Poipu, Kauai, approximately 6 months out of the year and we want to provide our deepest concerns regarding the Hawaii Dairy Farm (HDF) proposed for construction in the pristine area of Maha'ulepu located in the SE coastal area of Kauai County.

While we realize that Hawaii desires additional economic drivers for its economy, this cannot come at the certain degradation to its environment and protected wildlife. This is particularly true when the benefits are miniscule as compared to the considerable negative impacts this non-critical business venture would certainly bring to this beautiful and highly regarded tourist and resort area of Poipu.

We are asking that the Hawaii Department of Environmental Protection and the Hawaii Department of Health thoroughly evaluate and at a minimum require very strict stipulations for this operation.

As to how this operation would negatively impact us personally and directly (and others like us) is the high probability of it causing health issues. Both my wife and I are retired and she has an impaired immune system that makes her highly susceptible to infections – particularly sinus infections. The reason we purchased a home in Kauai (and Poipu in particular) is its pristine conditions – most notably its air. The location of a potentially high density dairy operation less than 3 miles upwind of our home would create a host of health issues for people with upper respiratory and sinus conditions that visit here for the benefits of breathing pristine salt air carried in by the prevailing northeasterly trade winds. These trade winds travel thousands of miles unencumbered by human interference and pollution. These conditions would be considerably degraded and in our case could lead to my wife catching infection from microscopic particles carried in on the trade winds from the dairy. If this happens we will be forced to try and sell our property (no doubt it will be worth less than we paid for it 10 years ago) and relocate to another area. Because we are retired and planning to spend more time in Kauai, the fate of this HDF will have a significant impact on our future plans as well as the well-being of my wife. My wife's infectious disease doctor in Denver (as well as her ear, nose, and throat doctor) recommends that we consider living in Poipu full time due to its pristine conditions and the noticeable improvements in her health when we are on Kauai.

We have spent most of our adult lives in the Denver metropolitan area and even though we are over 50 miles away from similar dairies as the proposed HDF, when the wind shifts to the NE the odors from the dairies are overpowering even in Denver. I personally spent 2 decades working on projects close to several dairies in Weld County (that I will not name), but several are located near Platteville, CO. I can say firsthand that the stench from the dairies on certain days was overpowering. Those days (fresh rain, high humidity, and warm temperatures) made working near the diary unbearable. While these conditions are few in number in the high arid conditions of Colorado, they are an everyday occurrence at the proposed site in Maha'ulepu. I will barely address the proliferation of insects at dairies in Colorado except to say, when working near the dairies my crew and I could not eat within a mile of the facility without sitting in our trucks with the windows rolled up and the air conditioning on or otherwise

daily hatching flies fresh from eating manure and feasting on the green slime of the catch ponds would invade us and land on our lunches making them inedible. Conversely, people (residents and tourists) come to Poipu to eat fresh seafood outside and enjoy the views and smell of gardens and the salt air.....NOT the stench from the catch ponds at the proposed dairy and be continually irritated and potentially harmed by disease carrying flies (and mosquitos as well).

The bottom line is unlike the pastoral setting of cows grazing in a field that Group 70 purposefully put on the cover of their document to present a perceived peaceful ambience for their project, a working dairy is a dirty, smelly, disease ridden place where crews wear knee high rubber boots, arm length rubber gloves, walk around in ankle deep filthy sludge and wear masks to protect their lungs as it is a very unhealthy place to be around or even be near. Dairies should not be positioned near any populated area as many studies have shown. We would respectfully ask the DOH and HEPA to consider these issues as well as several other points that were glossed over or completely ignored in the preliminary document provided by Group 70 regarding the proposed HDF:

1. Soil conditions – as a licensed engineer with a minor in geology and 40 years working with geologists I can say that soil conditions in any large area is highly variable and is certainly not homogenous. Therefore, we would request that a more thorough and rigorous soil analysis be performed of the dairy site including multiple soil samples taken at various depths in a multitude of areas before reaching any conclusion about whether or not the soil would have enough permeability to transmit effluent urine and feces residue down to groundwater. In an area of 570+ acres there will no doubt be areas where the clay content is limited to minimal and will allow percolation of contaminated fluids into the groundwater. But at the same time, high clay content in other areas will hold fluid and result in significant run off of fluids downslope to the ocean. What will be the plans to prevent this and what is the penalty when this inevitably occurs? Pay a fine for continuing to pollute?
2. Along the same vein, there needs to be a data driven monitoring set of processes to insure no contaminated effluent gets to groundwater such as drilling monitoring wells along the perimeter of the property as well as wells offsetting the "effluent catch basins" to insure they are not leaking. Likewise, the design and construction of these "catch basins" need to be clarified including how (and with what they will be lined) and how much head board (berm) will be included to insure they will not be overrun when extended heavy rains occur.
   We are incredulous that there will be county and private potable drinking water wells located within 750' from this operation. A study as to fluid transport through this type of soil has to be required including transmissibility rates and directionality. Potable drinking water on Kauai (as well as the other islands) is priceless...just check ask Moloka'i.
3. A detailed plan regarding dust particulate mitigation is needed and not just during the construction period. More importantly will be continual mitigation efforts during the permanent operation when equipment is continually moving into and out of the facility relocating cows around the facility, bringing in other needed farming and milking equipment, daily transportation of the milk to its final processing plant. Group 70 did not mention that the limited road infrastructure into this area is all dirt.
4. A detailed cost/benefit analysis is needed to measure the benefits of this dairy (how many actual <u>permanent jobs</u> will be created and expected tax revenues) vs. several scenarios of estimated reductions in tourist traffic (and loss of established permanent jobs to hotels and homes that are seasonal vacation rentals) due to the odors

originating just 2.5 miles upwind of one of the two largest tourist destinations on Kauai. Once word gets out regarding the odor problem in Poipu, the average tourist will choose to spend his/her vacation elsewhere.

5. In addition, a larger and more specific data set should be required regarding current occupancy rates of residences at Poipu. The vague statement that 56.2% of the housing units are vacant does not appear current or factual. How was this one number derived and when/where did it originate?
6. From first hand observation the Hawaiian Monk Seal and Green Sea turtles reside in the waters and beaches ½ mile downslope from this proposed operation. Also, the threatened and endangered (T&E) Humpback whale frequents the waters on this side of Kauai. These specific animals (along with lots of large sea birds) are seen daily in this area. The EIS needs to provide protection for these sea creatures from any potential damage to their habitat from contaminated run off that could occur during monsoonal rains and floods such as the "40 days of rain" that occurred in the Koloa and Poipu area a few years back. Also protection is needed to prevent birds (particularly T&E fowl) from landing in the filthy and disease ridden "catch basins".
7. It is a faulty argument to equate historic sugar cane production that ended decades ago as equivalent to a high density dairy operation. Tons of sanitary waste (urine and feces) were not created with these operations and the cultural aspects of the area (including the extremely rare Makauwhi Cave) were unknown when these operations began. Now we know that this particular cave is very rare and holds tremendous paleoecological and archaeological data and has been described as "maybe the richest fossil site in the Hawaiian Islands and perhaps in the entire Pacific Island region". The area around this site has been painstakingly improved and is becoming a favorite visiting site for locals and non-locals to visit and learn about the ancient history of this area. This area is directly offsetting the HDF to the south and will be severely impacted by foul odors emitted from the dairy.

   Data is needed in the EIS referencing similar high density dairy operations in a "tropical environment" loaded with cultural artifacts and what measures are needed for a setting such as Mahaulepu Valley.
8. Finally, even though this is referred to as a "zero discharge" facility which sounds nice, but in reality means all the manure and urine stay on-site....that is TONS and TONS of it. As Group 70 boasts the tons of cow manure will be spread throughout the property to fertilize the grass. Assuredly that much manure when it is spread back as fertilizer is quite a large point source of odor. With a little rain, the smell is horrific.

   My personal experience from being around dairies is grazing cows (often in groups of 20 or more) urinate and defecate when they feel like and where they feel like it. If you have witnessed cows urinating and defecating first hand, it is not a small volume of urine or feces and certainly not a pleasant event to smell. How will all of this waste be handled? Will it be gathered daily into a pile? What about the urine? All of this will provide opportunity to potentially damage to groundwater in the high percolation areas and, of course, the odor emissions when the herd reaches 2,000 cows will be significant. While quite a bit of statistical data was included in the notice from the Group 70 regarding the amount of milk that the HDF would produce, <u>nothing</u> was included regarding how much urine, manure, belching and flatulence would be produced daily and the resulting methane (greenhouse gas) that would be released into the atmosphere. Published data support that cows emit a massive amount of methane through belching and flatulence. Statistics vary regarding how much methane the average dairy cow expels but some say it's up to 500 liters (132 gallons) per day or an amount comparable

to the pollution produced by a car in a day. While the Group 70 report refers to HDF using a "smaller" "kiwi cross cow", the difference in size is primarily in height not girth and the weights are nearly identical. The "kiwi cross cow" is a hybrid of a cross breed of Holstein and Jersey cows. Coincidently, in New Zealand a tax proposal on dairy cow flatulence has been considered and the "kiwi cross" dairy cow is used almost exclusively there. Please note the photo of a herd of "kiwi cross" dairy cows below:

"The large amounts of methane produced by cows are now a cause of concern and the subject of much scientific research. Agriculture is responsible for an estimated 14 percent of the world's greenhouse gases. A significant portion of these emissions come from methane, which, in terms of its contribution to global warming, is 23 times more powerful than carbon dioxide."

Adding in the smell of animal feces especially after it stays wet from daily rains (3-4 small showers a day are common in this area) and this entire area will not be a pleasant to visit nor a place to live. The smells are magnified when the sun comes out and the temperature and humidity rises. The offensive odors will be easily carried by the 15-25 mph trade winds that consistently blow from the NE downwind for miles. The statistics for total waste and methane the cows will generate should be calculated and a plan for its containment and remediation needs to be included in the EIS.

In conclusion, with all due respect to the HEPA and the HDOH, simply requiring "Best Management Practices" as part of the permit approval process will not prevent breaches and lapses in the HDF daily operating practices. One only has to do a case study on permitted facilities to see citation after citation issued for infractions where permit BMP's are continually violated. This often results in protracted legal battles over fault; arguments over the magnitude of the violations; and after much time passes minimal fines are sometimes collected. This does little to correct the environmental damage done. How this will be handled will need to be part of the EIS. A suggestion is that the DOH and HEPA have personnel on island and in the immediate area to monitor the operation and issue citations quickly when infractions occur.....in the real world, self-monitoring and self-reporting simply does not work.

We respectfully ask that all these factors be given serious consideration during the EIS preparation and review process.

Sincerely,

David Howell
Linda V. Howell

David and Linda Howell
1568 Pe'e Road, #212
Koloa, Hawai'i 96756

GROUP 70
INTERNATIONAL

PRINCIPALS

Francis S. Oda, Arch.D., FAIA, AICP, LEED AP
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Tom Young, MBA AIA
Paul T. Matsuda PE, LEED AP
Ma Ry Kim RIBA, ARB

OF COUNSEL

Ralph E. Portmore FAICP
Hitoshi Hida AIA

May 26, 2016

David & Linda Howell
1568 Pe'e Road, #212
Koloa, HI 96756

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

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HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

DAIRY OPERATIONS: Hawai'i Dairy Farms (HDF) will establish and operate a sustainable, pastoral rotational-grazing dairy farm in Māhā'ulepū Valley on the island of Kaua'i to produce fresh, locally available nutritious milk for Hawai'i families. The rotational-grazing method utilizes 100 percent of the cows' manure as natural fertilizer to grow pasture grass as a primary source of nutrition for dairy cows. This cost-effective method will reduce reliance on imported fertilizer and feed. Pasture grass will comprise at least 70 percent of the animals' diet. As a part of the Draft Environmental Impact Statement (EIS), the proposed facilities and operations for the dairy farm are described in Chapter 3.

The Environmental Impact Statement (EIS) Preparation Notice (EISPN), published January 23, 2015, described the proposed pasture-based rotational grazing system as a "zero-discharge, grass-fed dairy". The term "zero-discharge" under the U.S.

Environmental Protection Agency related to concentrated feeding operations (CAFO) is a system designed to not discharge pollutants into waters of the United States. As noted previously, the HDF system is designed to utilize 100 percent of the cows' manure on-site. However, nutrients would be introduced to the HDF site with any use; the Draft EIS identifies the amount of nutrients anticipated from the proposed dairy operations that could pass through to ground and surface waters. Therefore, HDF elected to discontinue use of the term "zero discharge" as it was construed as no nutrients into the system.

The term "grass-fed" was used in the HDF EISPN. This term was used to identify HDF's intent to utilize a locally-produced feedstock – grass – for more than 70 percent of the dairy herds' diet. In January 2016, the U.S. Department of Agricultural (USDA) Marketing Survey created a narrow legal definition of "grass-fed". The USDA standard defines what animals can and cannot be fed. The Food Alliance, a project of several northwest colleges, believes that when consumers choose grass-fed products there is an expectation that these will come from animals raised on pasture on a forage-based diet. Due to the evolving definition of "grass-fed", the term in not used in this EIS.

The dairy facilities will occupy an area of approximately 10 acres on the western boundary of the site. The developed area "footprint" will be less than 2 percent of the total farm area. Four buildings will be constructed to serve different functions, supported by utilities and infrastructure. Additional building information can be found in Draft EIS Section 3.3.1.

Agricultural infrastructure and utilities required for the dairy operations will include storage tanks and silos, effluent storage ponds, livestock water systems, and drainage improvements. The irrigation system and distribution of livestock water are discussed in Draft EIS Section 3.5, Pasture Management.

The pastoral rotational-grazing dairy provides a local feedstock – grass – as the herd's primary food source. Reducing imported feed stabilizes costs and provides a food source closer to the natural diet of cows. Results of grass trials initially conducted at five sites across four Hawaiian Islands were instrumental in identifying appropriate varieties of grass, and suitable sites to support sufficient "dry matter" grass yields essential to a cow's diet. Additional project-specific trials at the Māhā'ulepū site on Kauai have been conducted for more than 18 months. The results have identified sufficient yield and nutrition to supply 70 percent of the cows' diet; improvements in grass productivity are anticipated to provide up to 85 percent of cows' diet.

The pasture-based model allows cows to move about freely, and to lie down and rest, which is part of the digestion cycle. The animals are managed in social groups known as "mobs", mimicking the natural social order of bovines. Cows spend 22 hours of each 24-hour period foraging on pasture or resting, outdoors in natural light and fresh air. The gently sloped paddocks, walkways and races minimize the energy expended by the mature dairy cows as they graze or are transferred to and from the various paddocks and the mature dairy facility; surfaces of the walkways and cow races are designed to provide a comfortable path under hoof. The

management practices and pasture model applied by HDF maximizes grass as the cows' primary nutrition source and minimizes stress to the animals. Cows tend to be healthier and live longer, productive lives with access to fresh air, high quality feed, and exercise while they forage.

The 470 acres of pasture will be divided into paddocks averaging 3 to 5 acres in size. Smaller paddocks located near the dairy facility will be used as temporary pasture for cows or calves being moved on or off the farm. To protect the water quality of surface water and downstream areas, paddock fences are set back 35 feet from the edge of drainage ways throughout the site. Existing vegetation within the setbacks will be managed or restored to reduce erosion, improve stability of ditch banks, increase net carbon storage, and improve and maintain water quality.

The majority of the pastures will be irrigated with non-potable water and/or diluted effluent through either the pivot irrigation systems or through gun irrigators. Irrigation water supply is provided to the farm from Waita Reservoir, and will be filtered and pumped to the various irrigation components on the farm. The irrigation system is controlled using computer software and GPS receivers to allow very precise application of irrigation and/or diluted effluent on the pasture. The pivots can rotate and apply irrigation water and/or diluted effluent at different rates depending on the actual irrigation needs of the farm.

NRCS provides technical guidance on applying agricultural waste depending on the desired use of the waste. Reflected in the title of the livestock waste guidance for Hawai'i is the parenthetical inclusion of the word "nutrients." Where waste is utilized as a resource, it is being used for the constituent components that provide benefit.

The NRCS Conservation Practice Standard 590, Nutrient Management, applies to commercial fertilizers, organic by-products, waste water, organic matter, and irrigation water. Nutrient management is the practice of managing the amount, rate, source, method of application, and timing of plant nutrients and soil amendments. The timing and application of nutrients will correspond with plant uptake, soil properties and weather conditions. For more information on nutrient balance management see Draft EIS Section 3.5.3, and Draft EIS Appendix D.

The effluent storage ponds are sized to accommodate 30 days of storage for up to 2,000 mature dairy cows, and over 85 days of storage for 699 mature dairy cows. It will be highly unlikely that the storage pond will be full at any time for the contemplated 2,000-cow dairy, and nearly impossible for the committed 699-cow dairy. Throughout the less than 30-day storage period, effluent is planned for application every four days, and the slurry application is expected at least once every 45 days, to ensure that the ponds are kept at manageable levels.

Cows lactate milk following the birth of calves. Newborn calves will be housed on the Māhā'ulepū site and provided essential colostrum and nutrients for a healthy start. During the calves' initial 90 days, they will be transitioned to pasture at HDF before transfer to ranches on Kaua'i to be raised off-site. The committed herd size of 699 mature dairy cows at the Māhā'ulepū site applies to mature mature dairy cows.

Animals in various stages of lactation and rest will be transferred between HDF and other partner ranches as needed for animal health and dairy productivity. This will benefit both the dairy and infuse the beef market in Hawai'i with a new, local source of pasture-raised calves. Male calves will become part of the beef cattle herd; heifers (young female calves that haven't given birth) will be raised until ready to return to the HDF herd as a birthing/mature dairy cow. For more information on off-site herd management, refer to Section 3.7 of the Draft EIS.

Health of the herd is of primary importance as the success of a dairy relies on cows effectively producing quality milk. All cows will be treated with a high standard of care. Dairy managers and caretakers will be trained and competent in handling animals to minimize stress and ensure the herds' welfare. A licensed veterinarian may prescribe use of antibiotics approved by the Food & Drug Administration (FDA) for treatment of illnesses. Adherence to guidelines that prohibit milk from cows undergoing antibiotic treatment will ensure no adulteration of milk. Routine laboratory tests of milk for traces of antibiotic residue will be conducted. HDF will not inject cows with bovine growth hormone, referred to as rBST or rBGH.

SOILS: Soil is an ecosystem that can be managed to provide nutrients for plant growth, to absorb and hold rainwater for use during dryer periods, to filter and buffer potential pollutants from leaving fields, to serve as a firm foundation for agricultural activities, and to provide habitat for soil microbes to flourish and diversify to keep the ecosystem healthy. Two rounds of independent soil sampling were undertaken at HDF to understand and characterize available soil nutrients and conditions. Section 4.3 of the Environmental Impact Statement (EIS) characterizes soil conditions, and anticipated impacts from effluent and supplemental nutrient application. Recommendations from Dr. Russell Yost and Nicholas Krueger of the University of Hawai'i at Mānoa are summarized. Their baseline nutrient report is included as Appendix C of the Draft EIS.

Soil conservation is a core principal behind establishment of the NRCS, which was formed out of the Soil Conservation Service to acknowledge its expanded role in watershed-scale approach using science-based tools and standards in agronomy, engineering economics, wildlife biology and other disciplines to aid landowners in implementation of conservation practices. NRCS conservation practices are listed in Chapter 3, Section 3.2; these practices codes identify design and construction standards related to drainage, materials, operations and applicable engineering standards. HDF will follow the developed Conservation Plan, which was approved by the West Kaua'i Soil & Water Conservation District in December, 2013.

The United States Department of Agriculture (USDA) Natural Resources Conservation Services (NRCS) has mapped and classified soils for more than 95 percent of the United States. Comments received during the initial scoping for this EIS included a "Custom Soils Resource Report for Island of Kaua'i, Hawai'i." The report was generated from the USDA NRCS website, which allows any internet user to define an area of interest, customize data results, and generate a Custom Soil Resource Report. The user can select or deselect parameters based upon which data

the user would like to display. These user-generated reports are not evaluated by NRCS.

The NRCS soils classifications and descriptions provide a good information base, however, in-field soils testing is needed to identify existing soil nutrient levels and conditions. The most abundant soil types at the HDF site are Kalihi Clay at 32 percent, Ka'ena Clay Brown Variant at 29 percent, and Lualualei Clay at roughly 14 percent of the dairy site. Laboratory analysis of soil samples collected in 2014 identified levels of pH, phosphorus, nitrogen, potassium, calcium, magnesium, organic matter, salinity, micronutrients and other constituents. The results illustrate that the soils are depleted of nutrients, which is typical for lands formerly used for sugarcane. The soil nutrient status and fertility demands of the primary crop, Kikuyu grass, were used to identify the quantities of nutrients required for productive grass growth. The soils data provide a baseline to guide adaptive nutrient management throughout establishment and maturity of the dairy.

A second round of field sampling was conducted in 2015, and focused on evaluation of soils characterized as "poorly drained", and established a quantitative baseline of soil salinity and sodicity to provide for future monitoring of soil health with application of manure effluent. Laboratory analysis determined electrical conductivity and exchangeable sodium percentage, in addition to nutrient levels of nitrogen phosphorus calcium, magnesium, and potassium.

Poorly drained is not an indication of low or poor infiltration. Infiltration refers to the ability of water to enter the soil surface, whereas "drainage" refers to the movement of water within or from the soil profile. Poorly drained soils typically have low hydraulic conductivity, or a slow rate of groundwater movement through the soil. This slow movement can create anaerobic conditions, which typically result in higher rates of denitrification. This is the conversion of potentially nitrates and nitrites to gaseous forms, which reduces the potential for impacts on waterbodies. In this way, "poorly drained" soils may represent less risk of nitrate and nitrite leaching to associated waterbodies than "well drained" soils (Yost, 2016).

As a result of reduced movement of water through the soil profile, the mobility of nutrients such as potassium and phosphorus is also reduced. Soil types at the HDF site are known to adsorb and retain large amounts of phosphorus. Under the NRCS phosphorus leaching index for Hawai'i soils, HDF soils show low risk for leaching. With low risk, phosphorus can be applied at rates greater than crop requirements if manure or other organic materials are used to supply nutrients.

The dairy's focus on robust and healthy grass growth will build organic matter in soils through use of manure as a natural fertilizer. Soil can incorporate carbon from the atmosphere, which benefits soil health. According to recent studies in the Soil Science Society of America Journal, the conversion of formerly tilled cropland to grazed pasture can drive substantial accumulation of organic carbons in soil, with a potential to offset up to one-third of the annual increase in atmospheric carbon dioxide. The potential soil organic matter and carbon dioxide sequestration benefits are likely greatest in highly degraded soils in warm subtropical climates, partly due

to long pasture-growing seasons. Long-term soil impacts are anticipated to result in improvement to the physical, chemical, and biological condition of the soil.

ARCHAEOLOGICAL AND CULTURAL: The Hawai'i Dairy Farms (HDF) project is subject to a historic preservation review by the State Department of Land and Natural Resources, State Historic Preservation Division (SHPD) under HRS Chapter 6E and Chapter 13-284. An Archaeological Inventory Survey (AIS) and a Cultural Impact Assessment (CIA) were conducted by Scientific Consultant Services (SCS) for the proposed project. EIS Sections 4.7 and 4.8 provide an evaluation of archaeology and cultural resources, with technical studies in Appendix G and H.

A total of sixteen historic properties were identified through a pedestrian survey of the project area and an extended survey area of 100 meters of the northern boundary. Six historic-era sites occur in the project area and 10 sites occur in the extended survey area. Only one of the sites is believed to be associated with pre-Contact and/or early historic times. State Site 50-30-10-2250, the agricultural heiau, and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area. The remaining sites consist of historic-era bridges, ditches, culverts, retaining walls, and a flume system dating from the 20th century and are affiliated with sugarcane cultivation.

That a majority of the documented sites are related to the historic-era is not surprising, given the massive landscape modifications that occurred during intensive sugarcane cultivation on the valley floor. Even historic era cultural materials associated with the many Land Commission Awards in the project area were non-existent, as explored through survey and subsurface exploration.

The sixteen historic properties have been assessed for significance by the archaeological consultant and the dairy project is anticipated to have no impact on these sites. No further archaeological work is recommended for the sites. Two of the sixteen sites are considered significant under multiple criteria, but occur outside the project area on lands owned by a different landowner. Both sites will not be adversely affected by the proposed dairy project. No site is related to burials, and no bonex were found. Such sites have been reported along coastal areas in sand dunes.

The cultural assessment examined the potential effect of the project on cultural resources, practices or beliefs, its potential to isolate cultural resources, practices or beliefs from their setting, and the potential of the project to introduce elements which may alter the setting in which cultural practices take place. Information received from the community indicates the Māhā'ulepū Ahupua'a, has been and is currently used for traditional cultural purposes. However, the dairy project area has not been included in these activities. It is clear that the gathered plants, trails, State Site 50-30-10-2250, the agricultural heiau, and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area.

The project will be fully enclosed by perimeter fencing along the boundary of the leased premises, which will ensure that project activities and any related impacts are contained within the project area. Based on the research and comments received from the community, it is reasonable to conclude that, pursuant to Act 50, the

exercise of native Hawaiian rights or any ethnic group related to numerous traditional cultural practices will not be impacted by establishment of the dairy.

DEMOGRAPHIC AND ECONOMIC: The potential impacts of Hawai'i Dairy Farms (HDF) to the existing economy were evaluated in the Draft Environmental Impact Statement (EIS), including a fiscal impact assessment report completed in April, 2016 by Plasch Economics Pacific. Draft EIS Section 4.15 addresses demographic and economic factors, with the complete report in Appendix J.

The HDF project would create short-term benefits through jobs for local construction personnel and local material suppliers. Such jobs would include equipment operators, cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, supervisors, painters, etc. Based on State employment multipliers, indirect employment related to Dairy construction would be expected to average about 16 jobs on Kaua'i, and 8 on O'ahu. Construction employment would be expected to average about 12 jobs per year during the development period. Thus direct-plus-indirect employment association with construction would be expected to average approximately 36 jobs, of which 28 would be on Kaua'i.

The HDF project would contribute to diversification of Kaua'i's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Hawai'i Island), approximately10 percent of Hawai'i's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and indirect full-time equivalent jobs on Kaua'i, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on O'ahu.

HDF is expected to generate a net income of approximately $68,000 to the County when the 699 cow herd is established. When the dairy has matured to full production for the 699 cow dairy, net income to the State is calculated at $160,000 annually. With the potential contemplated herd size of up to 2,000 mature dairy cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be produced. This would double local milk production currently supplied by operational dairies on the Island of Hawai'i.

Additional employment generated by a possible expansion to accommodate the contemplated 2,000 mature dairy cow herd is estimated at approximately 3 construction jobs plus 4 indirect jobs on Kaua'i, and 2 indirect jobs on O'ahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an additional 5 full-time farm jobs would be added, with approximately 15 additional indirect jobs on Kaua'i and another 8 indirect jobs on O'ahu.

The dairy is expected to generate a net additional contribution to the County of approximately $8,000 for improvements related to expansion for the contemplated herd size of up to 2,000 mature dairy cows ($76,000 total versus $68,000 for the

committed herd size). The State will derive approximately $360,000 annually in revenues from the contemplated 2,000-mature dairy cow dairy.

Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhā'ulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhā'ulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Po'ipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhā'ulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic

material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawai'i Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhā'ulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhā'ulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhā'ulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kaua'i community.

Regional Water Demand: The adjacent, developed Kōloa-Po'ipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kaua'i will increase county-wide by 17,300 residents by 2030. The South Kaua'i population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kaua'i region (the Kōloa - Po'ipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and

visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhā'ulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhā'ulepū watershed.

The HDF site is located on the bottom-land of the upper Māhā'ulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Ha'upu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhā'ulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kaua'i Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhā'ulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhā'ulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could

be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhāʻulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Poʻipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kauaʻi community.

AIR QUALITY: As a part of the Environmental Impact Statement (EIS), existing air quality conditions and project impacts were evaluated, including dust and odor. Potential odors and emission levels for air pollutants relevant to dairy operations

were modeled, as currently there are no cows on site. EIS sections 4.19 and 4.25 provide an evaluation of air quality and odors, including a windrose depicting wind speed and direction in the area (see DEIS Section 4.1, Climate). The full air quality technical report can be found in Draft EIS Appendix I.

Clean Air Act

Under the *Clean Air Act of 1970* (CAA), amended November 1990, the U.S. Environmental Protection Agency (EPA) regulates both large and small sources of air pollutants by establishing National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. The State of Hawai'i has established its own *State Ambient Air Quality Standards* (SAAQS) that are as strict or, in some cases more strict than the NAAQS. State standards prohibit any visible emissions of fugitive dust from construction activities at the property line.

Emissions relevant to livestock operation include particulate matter and fugitive dust. Greenhouse gases related to dairy cows include methane (CH_4) from enteric fermentation, and both methane and nitrous oxide (N_20) emissions from manure application. No State or Federal regulations for greenhouse gas emissions from farm operations or small businesses currently exist.

DUST

Dust will be generated as cows move along soft limestone walkways that connect the paddocks and lead to and from the milking parlor. Potential fugitive dust emission rates were estimated from published literature, where particulate matter (PM) is measurable from the "drylots" of confined dairy operations where animals walk over dirt and dried manure throughout the day.

Applying the emission rates from this available literature greatly overestimates potential emission resulting from HDF. Cows in the pastoral rotational-grazing system will be on pasture 22 hours each day and will spend two hours – in two separate milking cycles –moving to and from the barn for the 10- to 15-minute milking sessions.

Using atmospheric dispersion modeling system (AERMOD), the rates were scaled to the size of the non-pasture areas used by cows at HDF. Results were added to the background concentration of particulate matter (both PM_{10} and $PM_{2.5}$) measured on the island of Kaua'i, and the total concentration was compared to the State ambient air quality standards. Only the contemplated herd size of up to 2,000 mature dairy cows was modeled, as at the lower threshold of 699 cows, the potential fugitive dust impact would be negligible. The estimated concentration for PM_{10} is 2.01 $\mu g/m^3$, well below the State standard of 150 $\mu g/m^3$. The estimated concentration for $PM_{2.5}$ is 0.23 $\mu g/m^3$, well below the Federal standard of 35 $\mu g/m^3$ (see Draft EIS Section 4.19 and Table 4-19.2).

ODOR

Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF, so air dispersion models were used to determine potential odor levels. Local weather data was used in conjunction with the AERMOD modeling system, and published rates for manure odors emissions for dairy heifers and effluent ponds were adapted to reflect the HDF facilities.

Odor emission sources identified for modeling at HDF were manure in the pasture fields, irrigation water containing diluted nutrients from effluent, the effluent storage ponds, and the dairy buildings. Odor rates from published research were applied. Odor isopleths (a line used to map all points having the same numerical value) were created to display the model findings. Odor is described in "odor units" at the threshold of perception, which is defined by the point at which 50 percent of panelists, in laboratory conditions, cannot smell the odor but 50 percent of the panelists can detect the odor.

Modeling results were generated for worst case meteorological conditions (low wind velocity / mixing). Generally, tradewinds will disperse odors to less than detectable levels beyond the HDF site; in periods of no wind, odor may not be dispersed creating the "worst case" scenario. In these periods without normal tradewind flow, the odor plume would extend to the south of the HDF site. Sections 4.19.2 and 4.25.2 of the EIS include graphics of the potential odor isopleths.

Results for the committed herd size of 699 mature dairy cows show that odors may be detectable by 50 percent of the sensitive population once per 200 hours, or 44 hours per year, within an area that extends approximately 1,670-feet (within one-third of a mile) beyond the dairy farm boundary, and does not reach recreational or residential areas. Results for the contemplated expanded herd size of up to 2,000 mature dairy cows show odors would not extend beyond 2,780 feet outside the HDF boundary (just over half a mile), again not reaching recreational or residential areas, and again with detection limited to 50 percent of the sensitive population approximately 44 hours per year. The parameters used in the analysis were intentionally conservative, and the impacts shown assume an unlikely confluence of worst-case meteorological data, irrigation location, and grazing location. Actual offsite odor impacts are likely to be much lower and/or less frequent than shown; it is likely odor detection beyond the HDF boundaries will be less frequent.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

From: marisa.hurley@hyatt.com
To: epo@doh.hawaii.gov
Cc: HDF
Subject: Dairy Farm EIS comments
Date: Monday, February 23, 2015 4:05:47 PM
Attachments: image001.png
image002.png
image003.png
image004.png
image005.png

Re: COMMENTS ON HAWAI'I DAIRY FARM'S ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE, DATED JANUARY, 2015.

Aloha,
I have very serious concerns about the proposed dairy at Mahaulepu Valley on Kauai. I am glad that an EIS will be prepared and hope that it will address the many issues, environmental, social and cultural, that a dairy in this location presents. While HDF states they are voluntarily doing this process, to truly be pono, this should have been done well in advance of any infrastructure changes or the announcement that a dairy IS going in at this location, as the EIS is designed to determine whether a project like a dairy ***should*** go in by providing substantive data that indicates that it will not be environmentally, culturally or socially harmful.

NUMBERS
Beginning with the proposed herd and the recent "reduction" in herd size to 699 (a significantly chosen number as 700 cows is classified as a Large Confined Animal Feed Operation). What is not noted by HDF with this revised herd size is that those 699 cows will be shipped in pregnant, thus there will be double that number after gestation. Males will then be thinned out through outsourcing and killing of a certain amount, so that 699 would be about 900 cows on the land after gestation. Regardless of this claim of a reduced herd size, the EIS must evaluate the plan based on the proposed final herd size of 2,000.

WASTE
According to the EPA, waste estimates for dairy cattle are equivalent to 164 times the amount of humans, thus the 2,000 cows would produce waste equivalent to approximately 328,000 people, fully 5 times the population of the entire island. Microorganisms causing health risks to humans like E. Coli, enterococcus and leptospirosis are common in the feces of cattle, these organisms could likely end up in the adjacent streams leading to the ocean as well as groundwater.

SOIL
HDF should be required to do a detailed, accurate soil survey to determine once and for all if the soil is able to handle the amount of waste that will accumulate and be applied via airborne spray as fertilizer. Again, had HDF followed proper protocol and done an EIS at the outset, perhaps they would have provided more accurate information on the soil in the area in question. Their initial plan stated that soil in the area was porous volcanic, which it is not. A later NRCS survey of the soil indicates that most of it is primarily clay with "very limited" capability to handle manure load and has a high potential for runoff.

DRINKING WATER WELLS
HDF should be required to do an extensive groundwater study to assess effects of waste applied to the soil. Their current Waste Management Plan does not identify all of the nearby drinking water wells and misrepresents the distance of some of those that are identified on the map. Most significantly, one well (Koloa F) is very near to the area in which their wastewater treatment

plant will apply the sludge that accumulates in the ponds.

AIRBORNE CONTAMINANTS
HDF plans to spray waste from the effluent ponds on the fields as fertilizer. These spray machines are very tall and with dominant trade winds the possibility of spray affecting homes and businesses downwind is a potential problem. The EIS should address airborne contaminants produced by the dairy and the environmental, health, and social impacts.

SOCIAL CONCERNS
The Mahaulepu area is popular for nature oriented activities and subsistence such as fishing, hiking, beach-going activities, bird watching and more. The EIS must address how these activities would be impacted by environmental effects from a large dairy of this size upstream of the beach-going area.

The Koloa/Poipu area is home to approximately 3,000 residents, all of whom will be downwind of the dairy and thus affected by any airborne contaminants or odor. The area is also one of the top 3 visitor destinations, providing significant income to both County and State through property, TAT, general excise and other taxes. Environmental air, water and vector control concerns from the dairy would reduce property values and make the area less desirable to visitors. The largest private employer for the island is within 2.5 miles of the proposed dairy and a thriving visitor industry encompasses the entire Koloa/Poipu area, a decrease in visitors to the area would adversely affect those employers thus causing loss of jobs and income for island residents. Reduced property values and visitors to the area would not only affect the local economy through loss of jobs/decreased incomes for residents, but reduced revenues for the State and County as well.

The above noted concerns should all be fully addressed by the EIS for Hawaii Dairy Farm's proposal at Mahaulepu Valley. Given the open, available, leasable land on the island, particularly that owned by lessor Grove Farm, this seems to be one of the most ill-suited locations for such an operation. Its proximity to freshwater sources, the ocean, nearby homes and businesses make this an extremely poor location for a dairy, especially given that all milk will have to be trucked to the port in Nawiliwili for shipment to Oahu for processing. The above noted environmental, health & social concerns in addition to this fact, render this a plan that will negatively impact the environment and economy of Kauai.

Mahalo for your careful consideration of my concerns and your diligence in evaluating the impacts of this project.

MARISA HURLEY
Director of Events

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GRAND | HYATT

May 26, 2016

Marisa Hurley
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marisa.hurley@hyatt.com

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Marisa Hurley:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

DAIRY OPERATIONS: Hawai'i Dairy Farms (HDF) will establish and operate a sustainable, pastoral rotational-grazing dairy farm in Māhā'ulepū Valley on the island of Kaua'i to produce fresh, locally available nutritious milk for Hawai'i families. The rotational-grazing method utilizes 100 percent of the cows' manure as natural fertilizer to grow pasture grass as a primary source of nutrition for dairy cows. This cost-effective method will reduce reliance on imported fertilizer and feed. Pasture grass will comprise at least 70 percent of the animals' diet. As a part of the Draft Environmental Impact Statement (EIS), the proposed facilities and operations for the dairy farm are described in Chapter 3.

The Environmental Impact Statement (EIS) Preparation Notice (EISPN), published January 23, 2015, described the proposed pasture-based rotational grazing system

as a "zero-discharge, grass-fed dairy". The term "zero-discharge" under the U.S. Environmental Protection Agency related to concentrated feeding operations (CAFO) is a system designed to not discharge pollutants into waters of the United States. As noted previously, the HDF system is designed to utilize 100 percent of the cows' manure on-site. However, nutrients would be introduced to the HDF site with any use; the Draft EIS identifies the amount of nutrients anticipated from the proposed dairy operations that could pass through to ground and surface waters. Therefore, HDF elected to discontinue use of the term "zero discharge" as it was construed as no nutrients into the system.

The term "grass-fed" was used in the HDF EISPN. This term was used to identify HDF's intent to utilize a locally-produced feedstock – grass – for more than 70 percent of the dairy herds' diet. In January 2016, the U.S. Department of Agricultural (USDA) Marketing Survey created a narrow legal definition of "grass-fed". The USDA standard defines what animals can and cannot be fed. The Food Alliance, a project of several northwest colleges, believes that when consumers choose grass-fed products there is an expectation that these will come from animals raised on pasture on a forage-based diet. Due to the evolving definition of "grass-fed", the term in not used in this EIS.

The dairy facilities will occupy an area of approximately 10 acres on the western boundary of the site. The developed area "footprint" will be less than 2 percent of the total farm area. Four buildings will be constructed to serve different functions, supported by utilities and infrastructure. Additional building information can be found in Draft EIS Section 3.3.1.

Agricultural infrastructure and utilities required for the dairy operations will include storage tanks and silos, effluent storage ponds, livestock water systems, and drainage improvements. The irrigation system and distribution of livestock water are discussed in Draft EIS Section 3.5, Pasture Management.

The pastoral rotational-grazing dairy provides a local feedstock – grass – as the herd's primary food source. Reducing imported feed stabilizes costs and provides a food source closer to the natural diet of cows. Results of grass trials initially conducted at five sites across four Hawaiian Islands were instrumental in identifying appropriate varieties of grass, and suitable sites to support sufficient "dry matter" grass yields essential to a cow's diet. Additional project-specific trials at the Māhā'ulepū site on Kauai have been conducted for more than 18 months. The results have identified sufficient yield and nutrition to supply 70 percent of the cows' diet; improvements in grass productivity are anticipated to provide up to 85 percent of cows' diet.

The pasture-based model allows cows to move about freely, and to lie down and rest, which is part of the digestion cycle. The animals are managed in social groups known as "mobs", mimicking the natural social order of bovines. Cows spend 22 hours of each 24-hour period foraging on pasture or resting, outdoors in natural light and fresh air. The gently sloped paddocks, walkways and races minimize the energy expended by the mature dairy cows as they graze or are transferred to and from the various paddocks and the mature dairy facility; surfaces of the walkways

and cow races are designed to provide a comfortable path under hoof. The management practices and pasture model applied by HDF maximizes grass as the cows' primary nutrition source and minimizes stress to the animals. Cows tend to be healthier and live longer, productive lives with access to fresh air, high quality feed, and exercise while they forage.

The 470 acres of pasture will be divided into paddocks averaging 3 to 5 acres in size. Smaller paddocks located near the dairy facility will be used as temporary pasture for cows or calves being moved on or off the farm. To protect the water quality of surface water and downstream areas, paddock fences are set back 35 feet from the edge of drainage ways throughout the site. Existing vegetation within the setbacks will be managed or restored to reduce erosion, improve stability of ditch banks, increase net carbon storage, and improve and maintain water quality.

The majority of the pastures will be irrigated with non-potable water and/or diluted effluent through either the pivot irrigation systems or through gun irrigators. Irrigation water supply is provided to the farm from Waita Reservoir, and will be filtered and pumped to the various irrigation components on the farm. The irrigation system is controlled using computer software and GPS receivers to allow very precise application of irrigation and/or diluted effluent on the pasture. The pivots can rotate and apply irrigation water and/or diluted effluent at different rates depending on the actual irrigation needs of the farm.

NRCS provides technical guidance on applying agricultural waste depending on the desired use of the waste. Reflected in the title of the livestock waste guidance for Hawai'i is the parenthetical inclusion of the word "nutrients." Where waste is utilized as a resource, it is being used for the constituent components that provide benefit.

The NRCS Conservation Practice Standard 590, Nutrient Management, applies to commercial fertilizers, organic by-products, waste water, organic matter, and irrigation water. Nutrient management is the practice of managing the amount, rate, source, method of application, and timing of plant nutrients and soil amendments. The timing and application of nutrients will correspond with plant uptake, soil properties and weather conditions. For more information on nutrient balance management see Draft EIS Section 3.5.3, and Draft EIS Appendix D.

The effluent storage ponds are sized to accommodate 30 days of storage for up to 2,000 mature dairy cows, and over 85 days of storage for 699 mature dairy cows. It will be highly unlikely that the storage pond will be full at any time for the contemplated 2,000-cow dairy, and nearly impossible for the committed 699-cow dairy. Throughout the less than 30-day storage period, effluent is planned for application every four days, and the slurry application is expected at least once every 45 days, to ensure that the ponds are kept at manageable levels.

Cows lactate milk following the birth of calves. Newborn calves will be housed on the Māhā'ulepū site and provided essential colostrum and nutrients for a healthy start. During the calves' initial 90 days, they will be transitioned to pasture at HDF before transfer to ranches on Kaua'i to be raised off-site. The committed herd size of

699 mature dairy cows at the Māhā'ulepū site applies to mature mature dairy cows. Animals in various stages of lactation and rest will be transferred between HDF and other partner ranches as needed for animal health and dairy productivity. This will benefit both the dairy and infuse the beef market in Hawai'i with a new, local source of pasture-raised calves. Male calves will become part of the beef cattle herd; heifers (young female calves that haven't given birth) will be raised until ready to return to the HDF herd as a birthing/mature dairy cow. For more information on off-site herd management, refer to Section 3.7 of the Draft EIS.

Health of the herd is of primary importance as the success of a dairy relies on cows effectively producing quality milk. All cows will be treated with a high standard of care. Dairy managers and caretakers will be trained and competent in handling animals to minimize stress and ensure the herds' welfare. A licensed veterinarian may prescribe use of antibiotics approved by the Food & Drug Administration (FDA) for treatment of illnesses. Adherence to guidelines that prohibit milk from cows undergoing antibiotic treatment will ensure no adulteration of milk. Routine laboratory tests of milk for traces of antibiotic residue will be conducted. HDF will not inject cows with bovine growth hormone, referred to as rBST or rBGH.

ARCHAEOLOGICAL AND CULTURAL: The Hawai'i Dairy Farms (HDF) project is subject to a historic preservation review by the State Department of Land and Natural Resources, State Historic Preservation Division (SHPD) under HRS Chapter 6E and Chapter 13-284. An Archaeological Inventory Survey (AIS) and a Cultural Impact Assessment (CIA) were conducted by Scientific Consultant Services (SCS) for the proposed project. EIS Sections 4.7 and 4.8 provide an evaluation of archaeology and cultural resources, with technical studies in Appendix G and H.

A total of sixteen historic properties were identified through a pedestrian survey of the project area and an extended survey area of 100 meters of the northern boundary. Six historic-era sites occur in the project area and 10 sites occur in the extended survey area. Only one of the sites is believed to be associated with pre-Contact and/or early historic times. State Site 50-30-10-2250, the agricultural heiau, and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area. The remaining sites consist of historic-era bridges, ditches, culverts, retaining walls, and a flume system dating from the 20th century and are affiliated with sugarcane cultivation.

That a majority of the documented sites are related to the historic-era is not surprising, given the massive landscape modifications that occurred during intensive sugarcane cultivation on the valley floor. Even historic era cultural materials associated with the many Land Commission Awards in the project area were non-existent, as explored through survey and subsurface exploration.

The sixteen historic properties have been assessed for significance by the archaeological consultant and the dairy project is anticipated to have no impact on these sites. No further archaeological work is recommended for the sites. Two of the sixteen sites are considered significant under multiple criteria, but occur outside the project area on lands owned by a different landowner. Both sites will not be adversely affected by the proposed dairy project. No site is related to burials, and no bonex

were found. Such sites have been reported along coastal areas in sand dunes.

The cultural assessment examined the potential effect of the project on cultural resources, practices or beliefs, its potential to isolate cultural resources, practices or beliefs from their setting, and the potential of the project to introduce elements which may alter the setting in which cultural practices take place. Information received from the community indicates the Māhāʻulepū Ahupuaʻa, has been and is currently used for traditional cultural purposes. However, the dairy project area has not been included in these activities. It is clear that the gathered plants, trails, State Site 50-30-10-2250, the agricultural heiau, and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area.

The project will be fully enclosed by perimeter fencing along the boundary of the leased premises, which will ensure that project activities and any related impacts are contained within the project area. Based on the research and comments received from the community, it is reasonable to conclude that, pursuant to Act 50, the exercise of native Hawaiian rights or any ethnic group related to numerous traditional cultural practices will not be impacted by establishment of the dairy.

DEMOGRAPHIC AND ECONOMIC: The potential impacts of Hawai'i Dairy Farms (HDF) to the existing economy were evaluated in the Draft Environmental Impact Statement (EIS), including a fiscal impact assessment report completed in April, 2016 by Plasch Economics Pacific. Draft EIS Section 4.15 addresses demographic and economic factors, with the complete report in Appendix J.

The HDF project would create short-term benefits through jobs for local construction personnel and local material suppliers. Such jobs would include equipment operators, cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, supervisors, painters, etc. Based on State employment multipliers, indirect employment related to Dairy construction would be expected to average about 16 jobs on Kaua'i, and 8 on O'ahu. Construction employment would be expected to average about 12 jobs per year during the development period. Thus direct-plus-indirect employment association with construction would be expected to average approximately 36 jobs, of which 28 would be on Kaua'i.

The HDF project would contribute to diversification of Kaua'i's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Hawai'i Island), approximately10 percent of Hawai'i's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and indirect full-time equivalent jobs on Kaua'i, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on O'ahu.

HDF is expected to generate a net income of approximately $68,000 to the County when the 699 cow herd is established. When the dairy has matured to full

production for the 699 cow dairy, net income to the State is calculated at $160,000 annually. With the potential contemplated herd size of up to 2,000 mature dairy cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be produced. This would double local milk production currently supplied by operational dairies on the Island of Hawai'i.

Additional employment generated by a possible expansion to accommodate the contemplated 2,000 mature dairy cow herd is estimated at approximately 3 construction jobs plus 4 indirect jobs on Kaua'i, and 2 indirect jobs on O'ahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an additional 5 full-time farm jobs would be added, with approximately 15 additional indirect jobs on Kaua'i and another 8 indirect jobs on O'ahu.

The dairy is expected to generate a net additional contribution to the County of approximately $8,000 for improvements related to expansion for the contemplated herd size of up to 2,000 mature dairy cows ($76,000 total versus $68,000 for the committed herd size). The State will derive approximately $360,000 annually in revenues from the contemplated 2,000-mature dairy cow dairy.

Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhāʻulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick

alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhāʻulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Poʻipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhāʻulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawaiʻi Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhāʻulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhāʻulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhāʻulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kauaʻi community.

Regional Water Demand: The adjacent, developed Kōloa-Poʻipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kauaʻi will increase county-wide by 17,300 residents by 2030. The South Kauaʻi population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kauaʻi region (the Kōloa - Poʻipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhāʻulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhāʻulepū watershed.

The HDF site is located on the bottom-land of the upper Māhāʻulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Haʻupu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhāʻulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kaua'i Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhā'ulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhā'ulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhā'ulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain

the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhā'ulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Po'ipū region were also calculated. Nitrogen input to the marine environment in the Po'ipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Po'ipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean

water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kaua'i community.

AIR QUALITY: As a part of the Environmental Impact Statement (EIS), existing air quality conditions and project impacts were evaluated, including dust and odor. Potential odors and emission levels for air pollutants relevant to dairy operations were modeled, as currently there are no cows on site. EIS sections 4.19 and 4.25 provide an evaluation of air quality and odors, including a windrose depicting wind speed and direction in the area (see DEIS Section 4.1, Climate). The full air quality technical report can be found in Draft EIS Appendix I.

Clean Air Act

Under the *Clean Air Act of 1970* (CAA), amended November 1990, the U.S. Environmental Protection Agency (EPA) regulates both large and small sources of air pollutants by establishing National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. The State of Hawai'i has established its own *State Ambient Air Quality Standards* (SAAQS) that are as strict or, in some cases more strict than the NAAQS. State standards prohibit any visible emissions of fugitive dust from construction activities at the property line.

Emissions relevant to livestock operation include particulate matter and fugitive dust. Greenhouse gases related to dairy cows include methane (CH_4) from enteric fermentation, and both methane and nitrous oxide (N_20) emissions from manure application. No State or Federal regulations for greenhouse gas emissions from farm operations or small businesses currently exist.

DUST

Dust will be generated as cows move along soft limestone walkways that connect the paddocks and lead to and from the milking parlor. Potential fugitive dust emission rates were estimated from published literature, where particulate matter (PM) is measurable from the "drylots" of confined dairy operations where animals walk over dirt and dried manure throughout the day.

Applying the emission rates from this available literature greatly overestimates potential emission resulting from HDF. Cows in the pastoral rotational-grazing

system will be on pasture 22 hours each day and will spend two hours – in two separate milking cycles –moving to and from the barn for the 10- to 15-minute milking sessions.

Using atmospheric dispersion modeling system (AERMOD), the rates were scaled to the size of the non-pasture areas used by cows at HDF. Results were added to the background concentration of particulate matter (both PM_{10} and $PM_{2.5}$) measured on the island of Kaua'i, and the total concentration was compared to the State ambient air quality standards. Only the contemplated herd size of up to 2,000 mature dairy cows was modeled, as at the lower threshold of 699 cows, the potential fugitive dust impact would be negligible. The estimated concentration for PM_{10} is 2.01 $\mu g/m^3$, well below the State standard of 150 $\mu g/m^3$. The estimated concentration for $PM_{2.5}$ is 0.23 $\mu g/m^3$, well below the Federal standard of 35 $\mu g/m^3$ (see Draft EIS Section 4.19 and Table 4-19.2).

ODOR

Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF, so air dispersion models were used to determine potential odor levels. Local weather data was used in conjunction with the AERMOD modeling system, and published rates for manure odors emissions for dairy heifers and effluent ponds were adapted to reflect the HDF facilities.

Odor emission sources identified for modeling at HDF were manure in the pasture fields, irrigation water containing diluted nutrients from effluent, the effluent storage ponds, and the dairy buildings. Odor rates from published research were applied. Odor isopleths (a line used to map all points having the same numerical value) were created to display the model findings. Odor is described in "odor units" at the threshold of perception, which is defined by the point at which 50 percent of panelists, in laboratory conditions, cannot smell the odor but 50 percent of the panelists can detect the odor.

Modeling results were generated for worst case meteorological conditions (low wind velocity / mixing). Generally, tradewinds will disperse odors to less than detectable levels beyond the HDF site; in periods of no wind, odor may not be dispersed creating the "worst case" scenario. In these periods without normal tradewind flow, the odor plume would extend to the south of the HDF site. Sections 4.19.2 and 4.25.2 of the EIS include graphics of the potential odor isopleths.

Results for the committed herd size of 699 mature dairy cows show that odors may be detectable by 50 percent of the sensitive population once per 200 hours, or 44 hours per year, within an area that extends approximately 1,670-feet (within one-third of a mile) beyond the dairy farm boundary, and does not reach recreational or residential areas. Results for the contemplated expanded herd size of up to 2,000 mature dairy cows show odors would not extend beyond 2,780 feet outside the HDF boundary (just over half a mile), again not reaching recreational or residential areas, and again with detection limited to 50 percent of the sensitive population approximately 44 hours per year. The parameters used in the analysis were

intentionally conservative, and the impacts shown assume an unlikely confluence of worst-case meteorological data, irrigation location, and grazing location. Actual offsite odor impacts are likely to be much lower and/or less frequent than shown; it is likely odor detection beyond the HDF boundaries will be less frequent.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

-----Original Message-----
From: Kapua Janai [mailto:kapuajanai@gmail.com]
Sent: Monday, February 23, 2015 4:46 PM
To: EPO
Subject: EIS for Hawaii Dairy Farms

I am greatly concerned about the potential affects of the proposed Hawaii Dairy Farms project planned for the Po'ipu / Maha'ulepu area. I feel that there are many issues specific to this situation which need to be carefully examined, as the project could create irreparable damage for the island of Kauai, environmentally, financially, and culturally.

I am a resident of Kauai, and have been working at the ANARA spa at the Grand Hyatt for 15 years, in the immediate vicinity of the proposed project I ask that the study be designed to address all of the following issues.

~ It is crucial that the EIS be conducted in an honest and in depth manner. It therefore should be done by an independent organization.
Since Group 70 International has already been working with the HDF group, it is possible that they would be biased in their favor. It has been said, and rightly so, that it is possible to set up a study to prove what you want it to prove. Thus it is important that it not be set up with a pre-determined bias. Performing the study should be done by some organization not already connected to HDF.

~ In the overall plan for the county of Kauai, it has long been designated that Po'ipu is the primary tourist destination area. People arrive here from all over the world to experience our environment of sunshine, clean air, beautiful beaches, and swimmable ocean. This area currently provides an abundance of hotels, condos, beaches, restaurants, and shopping. They will not continue to come here if their experience is one of the stench of cattle, manure, insecticides, or pesticides, or the pestering presence of flies, or an ocean that is polluted by run-off of chemicals, urine, and manure. They will not want to be driving behind cattle trucks transporting a load of cattle to various temporary pastures.

Kauai is a tourist dependent economy. The number of people employed by all of the tourist dependent businesses in the Koloa-Po'ipu area far outweighs the number of people who would be employed by HDF. There are thousands of people dependent for their living on maintaining a clean, healthy, tourist-attracting environment. It is not right to endanger all of these for the profit of a single new business wanting to come in. The EIS must safeguard this community.

Careful consideration should be given to finding a more suitable location for such a project than this one which is close and upwind from our major tourist area, and extremely close to sea level and shoreline.

~ Kauai is fortunate to have one of the most beautiful and unique natural environments on the planet. It is a fragile ecosystem, so easily damaged. Any and all who are privileged to live here should hold it among their highest priorities to be the caretakers of this place, maintaining its health and protecting it. In this situation we are counting on those doing the EIS to assist us in preventing environmental damage, because once done, such damage is difficult, costly, and often impossible to reverse. I have read some of the other letters being sent regarding this issue, so I know that the particular details which need to be addressed are well documented. What I want to stress is that those doing the EIS must take seriously the potential impact this project could have on our precious Kauai.

~There also seems to be contradictory information being given about regarding the supposed benefits this project would bring. There is reference to supplying Kauai's families with a local source of milk. Yet elsewhere I have heard that HDF plans to sell most of the milk in the Far East. In some places they speak of grass-fed cows, yet elsewhere I have heard that they plan to use GMO corn to supplement the diet. So if there is any milk made available to Kauai, it will be contaminated with GMOs. If the current study aims to weigh the benefits and detrimental effects, these facts need to be checked out to see what the real situation is.

I surely hope that all of these matters will be strongly considered in designing this study. Thank you for your consideration.

May 26, 2016

Kapua Janai
kapuajanai@gmail.com

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Kapua Janai:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

Your comments were received by the State of Hawai'i Department of Health Environmental Planning office. The Department of Health forwarded a copy of your comments to Group 70 International in order to be included in the Draft Environmental Impact Statement (EIS) analysis. This letter was prepared in response to your comments.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

GROUP 70 OBJECTIVITY: Group 70 International, Inc. (Group 70) is responsible for the preparation and processing of the Hawai'i Dairy Farms Environmental Impact Statement (EIS). The EIS was prepared in accordance with the requirements of Chapter 343 Hawai'i Revised Statutes and the "Environmental Impact Statement Rules" (Chapter 200 of Title 11, Hawai'i Administrative Rules). The environmental planning team at Group 70 has prepared several hundred Environmental Assessment and EIS documents over the past 40 years, and every document has

been accepted by the responsible County, State and Federal agency. On numerous past EIS projects, the Hawai'i Chapter of the American Planning Association has recognized Group 70's professional work with Chapter awards for excellence in environmental planning. Part of the EIS scoping process involves Group 70's experienced team of technical sub consultants that are well-known and qualified in their respective fields of study. For this project, Group 70 is preparing the Hawai'i Dairy Farms EIS with the level of analysis required to properly evaluate and disclose the existing environmental conditions, probable impacts with mitigation, and potential cumulative and secondary effects.

PESTS: A study of invertebrate species and pest insects was conducted by Steven Lee Montgomery, PhD, Consulting Biologist in January 2016. The study summarizes the presence or absence of native species or pest species associated with cattle manure in the general Māhā'ulepū area, as well as the parasites and predators that control those species. No federally or state listed endangered or threatened invertebrate species were noted in the survey of the site. A full report and list of species found on site is provided in EIS Section 4.11 and Appendix B.

Flies were identified on the HDF site using manure from neighboring livestock as bait for invertebrates. The two flies associated with livestock are the stable fly and the horn fly, the latter known for biting cattle. These flies and the greenbottle fly are often confused with the house fly. Flies known to exist on Kaua'i but not seen at the HDF site include the house fly, the dog dung fly, and the chicken dung fly. These pests are common in areas with high pet populations. It is possible these fly species could inadvertently be brought to the dairy and utilize manure as a food source. HDF will prevent and control fly population growth through diligent clean up and sanitation practices regarding any trash and food waste, as well as through efficient manure composting practices. A full list of site management measures is provided in EIS Section 4.11. The project location does not provide any habitat for *drosophila musaphilia*, the only Kaua'i species of native Hawaiian fly listed as Endangered or Threatened. Native Drosophila habitat is located many miles away in the high elevation koa-'ōhi'a forests.

Fly populations at HDF will be minimized through a process known as Integrated Pest Management (IPM). Essentially, IPM disrupts reproduction with appropriate means at key points in the pest's life cycle. Used in Hawai'i for decades, a number of invertebrates and a bird (the cattle egret) were introduced between 1898 and 1950 to reduce livestock-related insects. IPM utilizes knowledge of the ancient food web among species.

An especially important insect to minimize fly breeding habitat in manure is the dung beetle, which buries manure and incorporates it into the soil. Populations of dung beetles found on Kaua'i and those species already in Māhā'ulepū Valley, will increase with the increased manure food source, thus increasing and speeding breakdown of manure. Dung beetles are specialists in the very important natural process of breaking up and quickly recycling bovine manure pads. The behavioral diversity among dung beetle species will work together to bury dung pats in one to three days, a shorter amount of time than the 10-30 days flies eggs need to hatch.

In the Kōloa-Po'ipū region, pest fly populations are dependent upon food and breeding sources nearby such as dog, cat, and chicken feces. Beef cattle graze in the region on agricultural lands along Ala Kinoiki Road between Kōloa and Po'ipū, and it is likely the livestock-related flies identified at the HDF site occur in this region as well. Localized controls to reduce pest populations need to address breeding sites in and amongst the food and animals wastes within the area. These mitigation measures will make it difficult for flies to breed, and BMPs will be enforced to address any increase in population, therefore it is expected that the dairy farm will not significantly affect recreational and resort areas.

DEMOGRAPHIC AND ECONOMIC: The potential impacts of Hawai'i Dairy Farms (HDF) to the existing economy were evaluated in the Draft Environmental Impact Statement (EIS), including a fiscal impact assessment report completed in April, 2016 by Plasch Economics Pacific. Draft EIS Section 4.15 addresses demographic and economic factors, with the complete report in Appendix J.

The HDF project would create short-term benefits through jobs for local construction personnel and local material suppliers. Such jobs would include equipment operators, cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, supervisors, painters, etc. Based on State employment multipliers, indirect employment related to Dairy construction would be expected to average about 16 jobs on Kaua'i, and 8 on O'ahu. Construction employment would be expected to average about 12 jobs per year during the development period. Thus direct-plus-indirect employment association with construction would be expected to average approximately 36 jobs, of which 28 would be on Kaua'i.

The HDF project would contribute to diversification of Kaua'i's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Hawai'i Island), approximately10 percent of Hawai'i's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and indirect full-time equivalent jobs on Kaua'i, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on O'ahu.

HDF is expected to generate a net income of approximately $68,000 to the County when the 699 cow herd is established. When the dairy has matured to full production for the 699 cow dairy, net income to the State is calculated at $160,000 annually. With the potential contemplated herd size of up to 2,000 mature dairy cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be produced. This would double local milk production currently supplied by operational dairies on the Island of Hawai'i.

Additional employment generated by a possible expansion to accommodate the contemplated 2,000 mature dairy cow herd is estimated at approximately 3

construction jobs plus 4 indirect jobs on Kaua'i, and 2 indirect jobs on O'ahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an additional 5 full-time farm jobs would be added, with approximately 15 additional indirect jobs on Kaua'i and another 8 indirect jobs on O'ahu.

The dairy is expected to generate a net additional contribution to the County of approximately $8,000 for improvements related to expansion for the contemplated herd size of up to 2,000 mature dairy cows ($76,000 total versus $68,000 for the committed herd size). The State will derive approximately $360,000 annually in revenues from the contemplated 2,000-mature dairy cow dairy.

Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhā'ulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhā'ulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of

soils in the adjacent Kōloa-Poʻipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhāʻulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawaiʻi Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhāʻulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhāʻulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhāʻulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kauaʻi community.

Regional Water Demand: The adjacent, developed Kōloa-Poʻipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kauaʻi will increase county-wide by 17,300 residents by 2030. The South Kauaʻi population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kauaʻi region (the Kōloa - Poʻipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhāʻulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhāʻulepū watershed.

The HDF site is located on the bottom-land of the upper Māhāʻulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Haʻupu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhāʻulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kauaʻi Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore

recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhāʻulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhāʻulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhāʻulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to

increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Poʻipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kaua'i community.

AIR QUALITY: As a part of the Environmental Impact Statement (EIS), existing air quality conditions and project impacts were evaluated, including dust and odor. Potential odors and emission levels for air pollutants relevant to dairy operations were modeled, as currently there are no cows on site. EIS sections 4.19 and 4.25 provide an evaluation of air quality and odors, including a windrose depicting wind speed and direction in the area (see DEIS Section 4.1, Climate). The full air quality technical report can be found in Draft EIS Appendix I.

Clean Air Act

Under the *Clean Air Act of 1970* (CAA), amended November 1990, the U.S. Environmental Protection Agency (EPA) regulates both large and small sources of air pollutants by establishing National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. The State of Hawai'i has established its own *State Ambient Air Quality Standards* (SAAQS) that are as strict or, in some cases more strict than the NAAQS. State standards prohibit any visible emissions of fugitive dust from construction activities at the property line.

Emissions relevant to livestock operation include particulate matter and fugitive dust. Greenhouse gases related to dairy cows include methane (CH_4) from enteric fermentation, and both methane and nitrous oxide (N_20) emissions from manure application. No State or Federal regulations for greenhouse gas emissions from farm operations or small businesses currently exist.

DUST

Dust will be generated as cows move along soft limestone walkways that connect the paddocks and lead to and from the milking parlor. Potential fugitive dust emission rates were estimated from published literature, where particulate matter (PM) is measurable from the "drylots" of confined dairy operations where animals walk over dirt and dried manure throughout the day.

Applying the emission rates from this available literature greatly overestimates potential emission resulting from HDF. Cows in the pastoral rotational-grazing system will be on pasture 22 hours each day and will spend two hours – in two separate milking cycles –moving to and from the barn for the 10- to 15-minute milking sessions.

Using atmospheric dispersion modeling system (AERMOD), the rates were scaled to the size of the non-pasture areas used by cows at HDF. Results were added to the

background concentration of particulate matter (both PM_{10} and $PM_{2.5}$) measured on the island of Kaua'i, and the total concentration was compared to the State ambient air quality standards. Only the contemplated herd size of up to 2,000 mature dairy cows was modeled, as at the lower threshold of 699 cows, the potential fugitive dust impact would be negligible. The estimated concentration for PM_{10} is 2.01 $\mu g/m^3$, well below the State standard of 150 $\mu g/m^3$. The estimated concentration for $PM_{2.5}$ is 0.23 $\mu g/m^3$, well below the Federal standard of 35 $\mu g/m^3$ (see Draft EIS Section 4.19 and Table 4-19.2).

ODOR

Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF, so air dispersion models were used to determine potential odor levels. Local weather data was used in conjunction with the AERMOD modeling system, and published rates for manure odors emissions for dairy heifers and effluent ponds were adapted to reflect the HDF facilities.

Odor emission sources identified for modeling at HDF were manure in the pasture fields, irrigation water containing diluted nutrients from effluent, the effluent storage ponds, and the dairy buildings. Odor rates from published research were applied. Odor isopleths (a line used to map all points having the same numerical value) were created to display the model findings. Odor is described in "odor units" at the threshold of perception, which is defined by the point at which 50 percent of panelists, in laboratory conditions, cannot smell the odor but 50 percent of the panelists can detect the odor.

Modeling results were generated for worst case meteorological conditions (low wind velocity / mixing). Generally, tradewinds will disperse odors to less than detectable levels beyond the HDF site; in periods of no wind, odor may not be dispersed creating the "worst case" scenario. In these periods without normal tradewind flow, the odor plume would extend to the south of the HDF site. Sections 4.19.2 and 4.25.2 of the EIS include graphics of the potential odor isopleths.

Results for the committed herd size of 699 mature dairy cows show that odors may be detectable by 50 percent of the sensitive population once per 200 hours, or 44 hours per year, within an area that extends approximately 1,670-feet (within one-third of a mile) beyond the dairy farm boundary, and does not reach recreational or residential areas. Results for the contemplated expanded herd size of up to 2,000 mature dairy cows show odors would not extend beyond 2,780 feet outside the HDF boundary (just over half a mile), again not reaching recreational or residential areas, and again with detection limited to 50 percent of the sensitive population approximately 44 hours per year. The parameters used in the analysis were intentionally conservative, and the impacts shown assume an unlikely confluence of worst-case meteorological data, irrigation location, and grazing location. Actual offsite odor impacts are likely to be much lower and/or less frequent than shown; it is likely odor detection beyond the HDF boundaries will be less frequent.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

From: Kahala622@aol.com
Sent: Sunday, February 22, 2015 4:05 PM
To: HDF
Subject: Hawaii Dairy Farm on Kauai

Aloha to All,

We live in a condo in Poipu six months of the year and spend our other six months in Washington state. We both grew up around dairy farms and remember the cow manure jokes and flies that grow in it. There is no way that we know of that will contain the cow manure smell from spreading out into the areas around Poipu.

The farm needs to be in another area of Kauai and not the tourist destination of Poipu and the beautiful pristine area of Mahaulepu.

Larry and Karen Jerdal

May 26, 2016

Larry and Karen Jerdal
Kahala622@aol.com

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Larry and Karen Jerdal:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

PESTS: A study of invertebrate species and pest insects was conducted by Steven Lee Montgomery, PhD, Consulting Biologist in January 2016. The study summarizes the presence or absence of native species or pest species associated with cattle manure in the general Māhā'ulepū area, as well as the parasites and predators that control those species. No federally or state listed endangered or threatened invertebrate species were noted in the survey of the site. A full report and list of species found on site is provided in EIS Section 4.11 and Appendix B.

Flies were identified on the HDF site using manure from neighboring livestock as bait for invertebrates. The two flies associated with livestock are the stable fly and the horn fly, the latter known for biting cattle. These flies and the greenbottle fly are often confused with the house fly. Flies known to exist on Kaua'i but not seen at the HDF site include the house fly, the dog dung fly, and the chicken dung fly. These pests are common in areas with high pet populations. It is possible these fly species could

inadvertently be brought to the dairy and utilize manure as a food source. HDF will prevent and control fly population growth through diligent clean up and sanitation practices regarding any trash and food waste, as well as through efficient manure composting practices. A full list of site management measures is provided in EIS Section 4.11. The project location does not provide any habitat for *drosophila musaphilia*, the only Kaua'i species of native Hawaiian fly listed as Endangered or Threatened. Native Drosophila habitat is located many miles away in the high elevation koa-'ōhi'a forests.

Fly populations at HDF will be minimized through a process known as Integrated Pest Management (IPM). Essentially, IPM disrupts reproduction with appropriate means at key points in the pest's life cycle. Used in Hawai'i for decades, a number of invertebrates and a bird (the cattle egret) were introduced between 1898 and 1950 to reduce livestock-related insects. IPM utilizes knowledge of the ancient food web among species.

An especially important insect to minimize fly breeding habitat in manure is the dung beetle, which buries manure and incorporates it into the soil. Populations of dung beetles found on Kaua'i and those species already in Māhā'ulepū Valley, will increase with the increased manure food source, thus increasing and speeding breakdown of manure. Dung beetles are specialists in the very important natural process of breaking up and quickly recycling bovine manure pads. The behavioral diversity among dung beetle species will work together to bury dung pats in one to three days, a shorter amount of time than the 10-30 days flies eggs need to hatch.

In the Kōloa-Po'ipū region, pest fly populations are dependent upon food and breeding sources nearby such as dog, cat, and chicken feces. Beef cattle graze in the region on agricultural lands along Ala Kinoiki Road between Kōloa and Po'ipū, and it is likely the livestock-related flies identified at the HDF site occur in this region as well. Localized controls to reduce pest populations need to address breeding sites in and amongst the food and animals wastes within the area. These mitigation measures will make it difficult for flies to breed, and BMPs will be enforced to address any increase in population, therefore it is expected that the dairy farm will not significantly affect recreational and resort areas.

AIR QUALITY: As a part of the Environmental Impact Statement (EIS), existing air quality conditions and project impacts were evaluated, including dust and odor. Potential odors and emission levels for air pollutants relevant to dairy operations were modeled, as currently there are no cows on site. EIS sections 4.19 and 4.25 provide an evaluation of air quality and odors, including a windrose depicting wind speed and direction in the area (see DEIS Section 4.1, Climate). The full air quality technical report can be found in Draft EIS Appendix I.

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ALTERNATIVES: As a part of the DEIS, alternatives were evaluated that could attain the objectives of the action's purpose and need, and were compared with environmental benefits, costs, and risks of each reasonable alternative against those of the proposed dairy project. Further discussion of alternatives can be found in DEIS Section 6.

The DEIS evaluates alternatives that could attain the objectives of the action's purpose and need, and compares environmental benefits, costs, and risks of each reasonable alternative against those of the proposed action. Additionally, reasonable land use alternatives that emerged from public input during the project scoping phase are documented and briefly discussed. The alternatives that do not meet the project purpose are not advanced for analysis of environmental benefits, costs, and risks. The Environmental Impact Statement Rules, Hawai'i Administrative Rules Chapter 11-200 (HRS 11-200) requires a discussion of alternatives that could attain the objectives of the action, regardless of cost. There is no requirement for the alternatives analysis to consider every possible land use.

Four possible land uses that would not meet the project purpose are discussed. Rezoning the land for resort or residential development, or a potential conservation condemnation are two uses that were examined and eliminated from analysis. These options would not be reasonably viable given the existing private land tenure and existing zoning. Two additional alternatives were considered as reasonable land uses as they could be permitted within the existing State Land Use Agricultural

District and County Agricultural Zoning District. These options include Agricultural Park with Processing Center, and development of an Agricultural Subdivision. The alternatives were examined and eliminated from further analysis, however, as they would not fulfill the project purpose.

The analysis, therefore, focuses on alternatives that meet the project purpose. Rigorous exploration and evaluation of the environmental impacts of the alternatives, including those that might enhance environmental quality or avoid, reduce or minimize some or all of the adverse environmental effects, costs and risks. These alternatives include: (1) the development of a Conventional Feedlot Dairy (a non-pasture-based dairy) at the same location; (2) development of the Pasture-Based Dairy at an Alternative Location on Kaua'i; and (3) milk products processing by HDF. The alternative of "No Action" is also evaluated.

The alternatives analysis provides a comprehensive evaluation of the range of potential alternatives, including the two alternative development scenarios. Although the alternatives are potentially reasonable uses under existing zoning and neighboring uses, each fails to comprehensively fulfill the project requirements defined by the eight Project Objectives and the four established Evaluation Criteria (Chapter 2, Sections 2.3.3 and 2.3.4).

The essential differences as compared to the proposed action are highlighted in the following statements.

- Only one of the alternative actions (conventional feedlot alternative) would create a commercial scale dairy operation in Hawai'i, with the capability to produce 10 percent of the State's fresh milk demand thus reducing dependence on imported milk (Objective 1). This alternative, however, would not reduce reliance on costly imported fertilizer and feed (Objective 2); grow local, quality grass as a primary feedstock (Objective 3); and would not utilize 100 percent of manure on site as nutrients to grow forage for dairy cows (Criterion 4).
- None of the alternatives would secure a dairy location that meets the requirements for a pastoral, pasture-based grazing dairy: sufficient contiguous land area; available long-term land tenure; adequate potable water supply; suitable soil properties; gentle slope conditions; and accessibility (Criterion 1).
- One alternative (Agricultural Park) could potentially generate new long-term employment in the agricultural sector on Kaua'i in a wide range of positions including pasture agronomy/soils science, environmental resources management (Criterion 2).
- The Agricultural Park alternative could also develop sustainable food production utilizing Important Agricultural Lands, demonstrating the importance of long-term agricultural leases and capital investment for agricultural infrastructure, water systems and support facilities. (Criterion 3). However, after years of trying, it appears there was limited interest in such a venture.
- Finally, addressing the range of potential environmental impacts (natural,

cultural, social and economic) (Objective 8) the two alternative development scenarios would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.

In contrast to the other options considered, the planned agricultural operation of Hawai'i Dairy Farms, was determined to be the most viable option and is the preferred alternative. Of all the alternatives considered, this is the only approach that achieves project objectives and meets each of the four Evaluation Criteria.

- Hawai'i Dairy Farms will create a commercial scale pasture-based dairy operation in Hawai'i, with the capability to provide more than 1,000,000 gallons of the fresh milk demand, reducing dependence on imported milk (Objective 1).
- The planned dairy location meets the requirements of minimum land area, soil properties, slope conditions, water supply, land tenure and availability, and accessibility (Criterion 1).
- The planned action will generate new long-term employment in the agricultural sector on Kaua'i, including pasture agronomy/soils science, veterinary and animal husbandry, environmental resources management, milk/milk processing, and dairy business management (Criterion 2).
- Sustainable food production utilizing Important Agricultural Lands (Criterion 3) will occur with the proposed action, demonstrating the importance of long term agricultural leases, and the ability to draw capital investment for agricultural infrastructure including water systems and support facilities (Criterion 3).
- Address the range of potential environmental impacts by utilizing 100 percent of manure as natural fertilizer to grow the majority of food for cows (Criterion 4). The alternatives evaluated would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.
- Creating an economically viable pasture rotational-grazing model maintains agriculture, retains open space, and provides buffer between highly utilized resort and residential development and sensitive natural or cultural resources (Objective 8).

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

From: McIntyre, Laura <Laura.McIntyre@doh.hawaii.gov>
Sent: Wednesday, February 04, 2015 1:39 PM
To: HDF
Subject: FW: Runoff to Ocean

Follow Up Flag: Follow up
Flag Status: Flagged

fyi

From: Rorajohn@aol.com [mailto:Rorajohn@aol.com]
Sent: Wednesday, February 04, 2015 1:30 PM
To: McIntyre, Laura
Subject: Fwd: Runoff to Ocean

Missent 1st time

From: Rorajohn@aol.com
To: laura.mcintyre@doh.hawaii.govr
Sent: 2/4/2015 3:07:29 P.M. Pacific Standard Time
Subj: Runoff to Ocean

Dear Ms. McIntyre,
Please excuse my intrusion in your time. In my"go far it" review of the new pending HDF purchase of Clover Leaf Dairy on the Big Island, I read quotes by the present owner-Ed Boteilho

"Our land runs right down to the Pacific Ocean," said Ed Boteilo the farm's operator. "On a clear day, you can see some of the other islands. During the winter we often see whales swimming by." (a photo was submitted)

That admission ("Our land runs right down to the Pacific Ocean,") underpins the worst environmental disaster New Zealand has faced in modern history. Under the "prevent language" of 344-1,In what manner does one alert/involve DOH to this high potential? Does DOH have steam readings of the Kahalo Ditch or at the ocean as the run off leaves the Clover Leaf dairy? Who would I talk to?
Thank You for your time.
Sincerely,
Ron
Ronald John
916-330-1924

From: Rorajohn@aol.com
Sent: Thursday, February 19, 2015 3:30 PM
To: HDF
Subject: Full text HDF EIS PN submission HDF
Attachments: FULLTE~3.DOC

Dear Mr Overton,
I have attached the full listing of questions, comments, concerns and questions I have organized re: the EIS of Hawaii Dairy Farms concept. I will also send by mail a hard copy. The other incomplete series sent to you by section are incomplete and should be deleted.
Please acknowledge by email a receipt of the attached 57 page document.
Thank You,
Ron
Ronald John

HDF –EIS – PN – Kauai

Comments, Concerns & Questions

RECEIVED
FEB 23 2015
GROUP 70 INTL

Ronald John
916-330-1924
rorajohn@aol.com

HDF- EIS- P N -Kauai Ronald John

Comments- Question-Concerns

My questions begin with a concern. As Group 70 authored the HDF proposal, why would they not, as a matter befitting objectivity, discontinue quoting questionable written statements in writing as demonstrated in the text of the EIS preparation? Composition bias is evident and confirmed by their outline. The expectation of objective fact finding is lessened by their active participation. You should never rule on what you also actively participated in creating, nor place yourself in a position of validating your own veracity or competence. To be actively involved in the EIS deliberations only exacerbates this concern and creates unnecessary suspicion**. Group 70 should recuse themselves from determining any factual truths considered in this EIS study. Why do they not?**

I began Dec 23 /2013 looking at the HDF concept while reviewing Kauai as a place to retire. After my 16 Jan 2014 Guest Opinion was published in the TGI, the HDF spokesperson with others in the room with her, called me. One of her questions to me was to paraphrase:" Why was I so concerned when I didn't even live there?" My answer was pointed. The gist of my response was:" Not there or anywhere should such a mistake be made." I think I referenced the Sistine Chapel as an example. I have lived and owned property in Kauai. I have family there. For many reasons it is my favorite place on earth. Careful regard should be given to such places wherever they might be.

My personal concerns/questions are multiple and have been discussed with experts in the field of agronomy, dairy, hydrology, atmospheric/weather, seismic activity, irrigation systems, statistics, and many others**.** A general over view and concern is the "One size fits all "mentality demonstrated in proposal areas requiring far more specificity and accuracy. The proposal as it now stands is a collective failure of due diligence. It appears more typical of an infomercial presentation attempting to promote a point of view, but void of sensible or reasonable conclusions, It is at best, conclusory allegations that have no support; void of the serious, deliberate analysis of data HDF should have submitted. It is riddled with inconsistencies both confusing and contradictory summations denied

by its own data. It is a "shoot oneself in the foot" performance, with HDFs own data conflicting more with its concept than supporting it. **By what standard was the HDF proposal written? By what standard was it judged**? Their method of analytics within a few pages becomes upside assertions, hardware boiler plate specs, promises and little objective support of stated/expected outcomes. **Can the EIS review process give a definitive summation of "suitability" of this proposal to present necessary information and true data based conclusions?**

Is need or necessity for this purposed commercial project within the scope of this EIS? If it is then a value contrast with any other use construct for this land is warranted. The underlying premise advanced with all manner of endearing phrases by HDF is that milk and thus this dairy is a necessity, a marker of a sustainability index of Hawaii's well being. It is not. Milk is an option not a necessity. The National Institutes of Health reports that around 65 percent of the human population has difficulty digesting cow milk. The dependency on cow milk much like the human appendix is no longer a valid argument. Its need, which in my beginning years of the1930s depression may have been warranted, has been replaced by far better nutritional options of equal cost or lower If Ulepono Initiative wanted to truly meet Hawaii s basic needs, they would best served Hawaii if staying with their stated goal of solar power.

HDF EIS PN lists **proposed action: Establish and operate the first grass-fed dairy in Hawaii, utilizing a sustainable, pasture based rotational grazing system. Produce fresh, locally available nutritious milk for Hawaii families**

No part of that "proposed action" is factually true. From failure to qualify as a "**grass fed dairy**" by definition of grass fed dairy to **locally available**, it is pure hype and contains nothing of substan**ce.** Meadow Gold owns the milk when it comes on Island in Oahu and will mix it with other state side milk sources during the pasteurization process. **Sustainability** can be a deceptive generalization, often a word wrapped around "an essential

needed by " or " for the long term good of the people." Often however it is a filmy cover of a "for profit" motive only,

By HDFs own indication "qualify for international sales" the intended sales target is obvious and not **just for Hawaii families.** Finally why would any of Meadow Gold milk be other **than nutritious w**hether for **Hawaii families** or for any one else? It is a PR green washing of new proportion. Hawaii deserves more than a spin doctor, emotional appeal**. Actually the real concern voiced by Kauai residents is "price of this particular product;" on that need, HDF has not yielded one penny.**

The basic information needed for any purchase or lease of land required to be a primary food source for cattle is knowing the quality of the soil, its type, its water holding capacity, the water requirements of the crop being considered, and many other related soil and water essentials. Will the EIS explain their misrepresentations? Why, after "five years of study" was this basic information advanced in error when submitting the first proposal?
HDF began the permitting process by submitting their application/proposal for approval by informing the West Kauai Soil and Water Conservation District that "the soil was free draining". They were believed at face value and approved, yet that basic assertion was both misleading and untrue. After being corrected, HDF continued to base conclusions as if it remained the same "free draining soil." One would believe that an NRCS review would have, at minimum, pointed out the many deficits of HDF s original proposal. Although NRCS officials made clear they did not "approve" the proposal, HDF continued to quote "approved" as support for their actions. NRCS, in my own opinion, failed their advisory/investigative capacity in this particular matter**. Should this deceptive beginning be an EIS concern**?

A clear indication of HDF awareness and the certainty of the farm flooding is given on pp; 73 last submitted proposal (Quote) "The dominant soils on the lower farm are Ka,ena Clay, Kalapa Silty Clay and Kalihi Clay (actually there are Ka'ena Clay and Kahili Clay type soil extending much farther through the farm in all directions-writer notation) which are prone to compaction and all are characterized by **poor draining**. "However less than two days after heavy rain, **with rapid removal of the surface water during and after a significant rain event**, they are observed as being dry

enough to graze even without a Kikuyu thatch." Just that admission should close the door on this site selection. It is self- confronting and damming. Keep in mind there are 352 Acres of Ka'ene Clay and Kahili Clay poorly draining type soil and that type soil extends much farther into this farm site and in all directions. **Will the EIS review evaluate the meaning and end result of applying this data?**
"Poor draining-"rapid removal of surface water" To where? With that admission, what other indication is needed to verify that draining manure laced soil to the streams is going to happen? If there is another definition to zero discharge what is it? If there is truth in the statement regarding soil type quoted above, on what basis would this farm site qualify as "suitable soils?" (seeGroup 70 EIS Preparation Notice pp.2-1) The words "promote efforts which will prevent or eliminate damage to the environment and biosphere---(Chapter 344-1) are clear. **What reasons, methods, or new knowledge will in reality support that the dairy project can do other than create serious damage? "Prevent" not wait until?**

The land total of the soils listed on pp3-1 of the HDF EIS Preparation Notice as Kalihi and Ka'ena soils is 352 acres. These soils have a Ksat level from 0.00 (no capacity intake) to 0.20.(1 fifth of an inch per hour)(pp 12 HDF proposal) A University of Nebraska dairy expert (name given by request) indicated that those soils can run off almost instantaneously," yet on pp 42 is the explanation that a 0.39 inch of water (as the pivots are rotating) is put down on the 352 acres of that soil type. The spray is by applicators dropping that amount as they continuously move- not a same spot application over longer time duration as does rainfall**. Will the EIS evaluate how it is possible that such application; approximately twice higher than the highest absorbent capacity of the soil, and on top of manure already deposited on the field, does not create a run off of a mixture of water and manure to on field drainage systems and on to the ocean? Drainage systems are not holding ponds. (see code 633 Waste Utilization page 2 of 3) "When liquid wastes are applied the application rate shall not exceed the infiltration rate of the soil and the amount of waste applied shall not exceed the moisture holding capacity of the soil profile at time of application. This is basic to every rate of application of liquid waste or water. Will the EIS review tell us what in the proposal, other than promises, display that this basic is**

understood. How was the limiting factor - holding capacity of the soil in the area recognized? What is unclear to HDF about this regulation? The ignoring of this understanding is replete throughout the entire proposal. Other than an overriding intention, what other reason can explain the ignoring of such clear, necessary, appropriate agricultural regulation? It is a basic agriculture standard.

Page 40 HDF proposal indicates a pivot rotation schedule of 40 hours each pivot. Poipu (next to the dairy) has a 16.2 mile an hour average yearly wind with gusts to 40-50 miles or higher an hour. Farther north toward the mountains it is higher. Sophisticated VRI irrigation systems can interpret weather conditions, but sudden, random gusts of higher winds first have to occur before shut down is activated. **All interactions have a time interval. Multiple ditches and streams traverse the areas and run off to the beach. Under these conditions, can an overspray wind drift transfer to the water ways occur? Why not?**

Irrigation experts point out that VRI equipment with so many more interactive components are prone to problems, and that the spray residue left on the pivot equipment may drop off when moving across ditches and streams. Is there a possibility that this contamination /pollution of the waterways will occur?
80 hours is required to irrigate not counting the time required for effluent spraying. Given the average yearly 16.2 wind factor, and the nutrient requirements determining the pivot use schedule, if held to a standard of no overspray/wind drift can HDF demonstrate how their irrigation scheduling requirements can be reasonably meet?
Does the failure of proper effluent and irrigation application scheduling effect all other nutrient variables?

On pp 39 of the HDF proposal is Table 12- is a listing of required irrigation days per month. No one should use averages in this type calculation nor apply any application on the basis of average. If the nutrient needs are spoken of as averages that too is wrong. HDF does however, indicate "significant rainfall in these months is probable and could cause the soil to exceed capacity from rainfall alone" (pp39). HDF does not show precise area soil Ksat data. **The Ksat data is given as a range. Its capacity to take in moisture could well be 0.00 (none) and not the highest rate of O.20. How then can the same rapid rate pivot irrigation concept of**

0.24 have any merit in reality? Isn't runoff or flooding the outcome of "exceeds capacity of rainfall alone?"

Given the information of the last question and the conceding of a 10.4 rain event by HDF, where would the millions of gallon (27,154 gallon per acre per inch of rain per hour) run off to from the other 576 acre(not counting that in the effluent ponds) when the manure covered fields receive this same rainfall amount? A 10.4 inch rain event on saturated soil will send 162,000,000 (162 million)gallon of manure laden rainfall on a downhill course 0.7 miles to the ocean That event was described by a rancher as "water higher than the 4 foot fence posts."

A 24 hour 100 year review of storm participation was offered as proof of compliance by an HDF spokesperson 23 January 2015 (Quote Amy Hennessey Jan21/15 TGI) "Our farm's effluent ponds are designed beyond the requires size to accommodate a 24 hour 100 year rain event." HDF uses the figure of 10.4 inches in a 24 hour time frame. That data is not remotely true.

National Oceanic and Atmospheric Administration data from1950 till 2000 (50 years) will point out how much defining data was ignored or left out by HDF. Specific to Kauai: there was Hurricane Hiki in 1950 with 52 inches falling in 4 days, Nina in 1957 with 20 inches of rainfall in 14 hours, Dot in 1959,with the eye directly over Kauai, Iwa in1982 with all gauges down-listed as Heavy rain, Iniki In 1992 all gauges down- listed as Heavy rain. If anything was left standing including dairy cows, these Hurricanes would have filled the ponds and quickly brought them to an overflowing, runoff stage.

Quote: "It is commonly believed from recent history that Kauai lays in a more vulnerable position than the other islands. However, in his recent analysis of Hawaiian hurricanes, Dr. Tom Schroeder of the University of Hawaii, Meteorology Department, concludes that every island has been affected by hurricanes and that no island is without risk." (NOAA report)

The unpredictable direction of hurricanes and tropical storms is a meteorologist's nightmare. Indicated in a 2002 NOOA document Atlas of Natural Hazards in the Hawaiian Coastal Zone is data showing that in just 43 years- (not 100 years) between1950 and 1993 there were 25 Hurricanes that hit the islands, and an additional 33 Tropical Storms rain events

occurred statewide. **In areas of known seismic activity, construction building standards, integrating that factor, are mandatory. So too are DOH standards for properly sized effluent ponds. Given "no island is not without risk" what support if any, can HDF give for not constructing effluent ponds based on actual rainfall data? What are the new dimensions of the ponds and the capacity/ Were they designed on a 2000 dairy cow basis. Page 47indicates"The pond is oversized to allow for Phase two effluent volume requirements yet it only displays "Phase 1 Minimum Volume gallons .Roughly speaking 2000 cows will fill the pond 3 time quicker than 700 cows. On page 53 one reads (Quote)" even twice this amount at 0.25 in won't be excessive if the soil moisture levels allow" That statement leads one to believe that HDF hasn't yet considered the now known and dominant major soil type (poorly draining) and ksat indication (0.00 to 0.20 in) that they are truly working with? Will the EIS review this area?**

On 15 Februry 2015 Kayle Datta (senior partner Ulepono Initiative) in a TGI Opinion wrote "To be clear, there has been no storm event that would exceed the capacity of the effluent ponds since rainfall has been recorded in Mahaulepu Valley" Three main concerns regarding this assertion need answering by the EIS review. One is the certainty that only at one time will the effluent ponds be totally empty .The milking parlor is in continuous use facility. The wash down and manure from the dairy cow, calving pens etc are flowing to the ponds on a 24 hour a day cycle. **What is the square footage of all areas that run to the effluent holding ponds? What is the total amount of water, manure and urine, general cleaning procedures, including wash down of each dairy cow and waste from the calving sheds etc. that will run into the effluent ponds per day?** On page 26 and 43 are listings of "gpd" (gallons per day) usage of water. On page 43 we see an indication of "2640 gpd Machine wash." In reviewing "gpd" it is difficult to find any wash down system that uses less the 6.8 gpd per dairy cow. HDF will wash down the dairy cow 2 times each day with a total of 3. 7 gallon per day. I**f more than that amount is required a 2000 cow wash down would place a significant higher**

amount of waste water in the ponds. Will the EIS be specific enough to analyze these possible variations? What are the new sizes of the ponds? Are they sized for 2000 dairy cows? If the total sq. ft area is larger than 16000 sq. feet (approx. 1 third acre) can one assume that a 1 inch rain event would by itself add approx.9000 gallon to the ponds? If that is correct how much more is added by the 1 inch rainfall runoff from all other milk parlor areas that run off to the ponds? The second concern is the narrow weather bandwidth of" rainfall in Mahaulepu valley" as a determinant of pond size. That data needs EIS review not just of an individual rain gauge, often not working, but rainfall from a much wider area (Lihue Airport for example)). NOAA weather records etc.) Third- it is not the effluent ponds that will do the most damage. It is the total rainfall amount of sustained storm events over successive days and which are significantly beyond Ksat intake ability that determines the outcome of these interrelationships**. . Wouldn't rainfall numbers charted against Ksat capacity numbers reveal whether/when runoff will begin?** It becomes a pollution runoff certainty when a rain event occurs and the high AU ratio to acre pod grazing method (300 to a pod) has left such a high amount of manure to be washed away from fully saturated soil. By the stocking rate(300 dairy cows per pod) the 3.2 to 4,2 acres pods become uncontained zones for the mixing of manure and rainwater.2,000 cows grazing on approximately 24 per day (83 cows per acre), will result in at least 200,000 lbs. of manure and 16,000 gallons of urine left daily on the clay soils found on the farm site On a "poorly draining" soil pod with a multi-day series of rainfall or a one day rainfall above 0.20 inch per hour, that combination of factors will result in runoff. Residents familiar with the area tells of "rapid rate rainfall that "started brown water run off all most immediately from its beginning," Protective barriers/berms are mandated to protect from fecal runoff from roadway ,raceways, runways and walkways**. What protects the steams from the runoff from pods?** What other explanations/outcomes are there? When used as a cane field it, as a matter of course, drained to the ocean. As the pods would now be covered in a high volume of manure that result is not allowed to happen .There are 26 single days in the last 25 years which

exceed the amount of rain that created significant flooding from run off of the HDF proposed dairy farm area. That 2 day amount of Feb 16 and 17th 2014 was 3.20 inches and flooding was noted. **Will the EIS confirm/ answer these concerns?**

Conspicuous by its presences, and also by its disregard by HDF planning, is a Taro Farm in the lower left hand quadrant of the property That private property requires flood irrigation, yet abuts a sludge containment area containing 82 acres and block F of 54 acres, which is described on pp73 "are perceived as heavy, flood frequently and difficult to crop. **No indication of protection or concern for the Taro Farm is written and runoff, over spray or intermingling of its water with effluent mixed water is not considered. Why not? What should be done to protect the Taro farm from this intrusion? By the same token what keeps the taro farm from spilling into the HDF farm site, mixing with the 82 acre M and S area and then draining directly to the ocean?**

Many states have Odor minimization plans Counties, townships etc. are growing rapidly in number as they put restriction on this form of pollution. .The recognition of the profound effect foul odor can have on the physical health of residents, and the debilitating outcome it will create on the economic climate of the community is becoming more based in scientific certainty. In Kauai 1000 jobs at minimum are on the line the first time a foul odor drifts to 1.7 miles from the dairy farm to the front door of the Hyatt and other nearby resorts. That downside information will travel around the tourist industry truly at the speed of light. Residential property values will significantly decrease as well as a significant tax income deficit will hit Kauai. **The health issues are numerous and a plan must demonstrate consideration for those about them. An EIS review should reveal if there was any evidence within the HDF proposal of this consideration. That review should assure and describe in detail on what basis these outcome will not occur**. A row of Norfolk Island pine won't do it The assurance given by HDF i.e. the cow will fart less, and nutrient supplements will make it smell less doesn't cut it so to speak.

My daughter and her family now live in Kauai. They, as I know, what Chino CA and now Tulare Co. in CA, smell like. England on a cross wind day can smell France's farm area. A farm odor of the nature of that which will be created is not compatible with the existing environment. Anaerobic digesters (which they did not select) can cut the odor down. Digester would help to minimize greenhouse gases, but nothing can stop it entirely. Even if digesters were used for the manure washing to the effluent ponds, there still remains the high tonnage of manure dropped on the paddocks each day That element will ripen in the sun or rain and the wind speed and direction, ambient air temperature, stability class, mixing height, and precipitation and pressure, will decide "that odor is headed downtown Koloa and Poipu. HDF's manager was a CAFO manager in Vado New Mexico in 2006. That "Dairy Alley" between Las Cruces and El Paso is known and written about by a national newspaper and featured by NPR. It is infamous for its pollution and smell and well the HDF manager is aware of it. The sludge dumpage on 82 acres is environmentally intrusive and unnecessary. It demonstrates corporately insensitivity to others around them .This placement of the sludge area closest to others(1.5 to 1-7 miles) outside the lower Mahaulepu Road fence is truly an "in your face" nose thumbing at Poipu. Koloa and the Lawai valley.

A odor minimization plan appears as an HDF postscript. HDF has treated that critical area with one line "All material will be handled in a manner to minimize the generation of particulate matter, odors and greenhouse gases."(HDF pp.85 first proposal) The same lonesome line is on page 75 of the 3rd proposal .It is not mentioned in the redacted proposal. That's it? Just the word or suggestion of odor mentioned once in a 100 page industrial sized dairy proposal? An apparent fill in the blanks or after thought? "Odor Minimization" no big deal-not even a mention in the proposal table of contents? When first approaching a dairy you might first spot the silos. No later than 2nd you smell the dairy. In " Understanding Concentrated Animal Feeding Operations and their Impact on Communities (Hribar and Schultz National Association of Local Boards of Health 2010) one finds a more serious understanding and summation.(Quote) "One of the most common complaints associated with CAFOs are the odors

produced. The odors that CAFOs emit are a complex mixture of ammonia, hydrogen sulfide, and carbon dioxide, as well as volatile and semi-volatile organic compounds (Heederik et al., 2007). These odors are worse than smells formerly associated with smaller livestock farms. The anaerobic reaction that occurs when manure is stored in pits or lagoons for long amounts of time is the primary cause of the smells. Odors from waste are carried away from farm areas on dust and other air particles. Depending on factors like weather conditions and farming techniques, CAFO odors can be smelled from as much as 5 or 6 miles away, although 3 miles is a more common distance. (Understanding Concentrated Animal Feeding Operations-State Environmental Resource Center, 2004)

To the writer the obvious absence of concern for this area is telling, shaming, and inexplicable. It flaws the due diligence aspect of proposal preparation. It is a glaring disregard of basics and its lack requires explanation in the EIS review.. Why or how can this factor be seen as insignificant by anyone of any level of agricultural knowledge? What tangible data support can HDF give that demonstrates no odor drift? What odor carry distance data have HDF developed beyond the HDF spokesman -while in New Zealand- not being unable to smell the effluent beyond 20 feet? What is the spectrum of health risks and environmental degradation? How are those elements clearly mitigated? What is the plan? As a small example why, if only for Koloa and Poipu's well being, is the sludge area located on lower Mahaulepu Road, nearest (approximately 1.5 to 1.7 miles) to Koloa and Poipu and not located to the rear by the effluent ponds?

All of the land where the Hyatt and other resorts are located were once zoned for 'agriculture use. **"How can this proposed dairy project location be considered compatible or justified. What is meant by "compatible usage**"? Sec 8 *1.5, Kauai County Code, 1987, as amended* defines compatible usage as follows: "Compatible Use" means a use that, because of its manner of operation and characteristics, is or **would be in harmony with uses on abutting properties in the same zoning district.** In judging compatibility the following shall be considered: intensity of

occupancy as measured by dwelling units per acre, pedestrian or vehicular traffic generated, volume of goods handled, **and other factors such as, but not limited to**: vibration noise level, smoke**, odor** or dust produced or light or radiation emitted.(*Sec. 8-1.5, Kauai County Code, 1987, as amended)* **What is meant by "and other factors such as but not limited to" in the above cited Kauai County code.? What does" odor" mean as mentioned in that Kauai County code?** When a project at best puts up as collateral a promise that it may result in 15 jobs and a product shipped off island to be mixed with stateside milk and also clearly states it won't be lower priced; **what indices justifies the risk of harm to benefit ratio?**

HDF EIS PN Kauai -Ronald John

2nd Series of comments- questions and concerns

The inability of most of the soil to percolate, the limited capacity of the ponds to hold an actual measure of what rainfall could bring, and the sustained and periodic rain events which last for days or weeks, (much as the 40 plus inches Easter flood of 2006) will create an uncontrolled release of polluted matter. In February HDF was sent pictures of the ""Easter" flood damage.. Seeing the clear, evident flood damage and knowing that other rain events have been left out of HDF considerations; for example In Dec 15 to-16 2008 a totaled of 11.11 inches fell at Mahaulepu, w**hy and for what reason is such information not been given due consideration by HDF? What specific reasons or improvements can HDF indicate that would explain why no pollution will leave the property? It isn't just about an effluent from the effluent ponds**. Every rancher that has used this property has seen the entire area flooding and often. Just last year the road below it was flooded. It is not an uncommon occurrence.

Amy Hennessey spokesperson of HDF wrote. "Water quality management is an important part of the plans for the dairy. We will be implementing a water quality-monitoring plan to help the farm be protective of the environment." A water quality monitoring plan tells you what is or has happened. With rapid run off release that time is often too late.

What HDF doesn't seem to understand is the difference in what they say they will do, and how**. HDF does not have a "how to do it" plan to handle pollution run off nor how to prevent it. They speak of it as a given or an accident, Why. Monitoring stations will tell you of it, but who needs a device to tell you its flooding? Then what? Call it an**

accident? (Certainties are not accidents) Move the cows? The dairy cows are either trying to stand up on slick water covered, non- absorbent clay soil or perhaps learning how to swim**. This area must be covered in the EIS evaluation process.**

HDF has presented a concept that preceding a rain event, overflow possibility they will empty the effluent ponds out on the fields (see page 54 HDF Quote) "If warranted due to potential impact from an approaching storm event the settling pond could also be pumped empty with in an additional 40 hours") This is an intentional transfer of waste when under threat of a weather event. EPA does not approve/condone that action (see Sec 633 Page 2 of 3 under Additional Criteria to protect water Quality). "Agricultural waste shall not be land applied on soils that are frequently flooded, as defined by National Cooperative Soil Survey during the period when flooding is expected." The manure covered fields would already be facing an overflowing of a mixture of manure and rain and such an additional dumping of effluent will add to that overflow...

The basic expectation is zero discharge. The first gust of wind on a windy evening at Mahaulepu, and the tall irrigation pivots and gun arrangement will leave pollution in the water ways of Mahaulepu. According to HDF there are 14 ditches traversing the property. No reputable irrigation expert or VRI representative will tell you that these devices are free of a level of spray scatter, mist or wind drift when operating, nor will they tell you that the system is a 100 percent error free. It is generally recommended that spray application of wastewater should be done under low wind (less than 5 mph) conditions and after mid-morning, preferably in bright sunshine **What VRI error rates were known by HDF**? **Given the 16.2 average**

wind speed at Poipu, in what manner can HDF spray effluent when needed, and make any assurance that polluted effluent doesn't reach the streams? What regulations have HDF adopted re: spray application and wind force?

Quote HDF spokesperson: "Most of our animals live, long, happy and milky lives."—Compared to the human species, the dairy cow is the princess and prima donna of the bovine world. She is far more sensitive and fragile than her cousin the range cow. To some she is a liquid white gold machine; an ATM so to speak. Unlike wild animals, the dairy cow cannot leave her pasture to seek protection under harsh conditions. You need to provide it for her. She will not want to be inside all of the time. However, she will need a shelter option when the weather gets nasty for prolong periods of time, need to escape fly swarms, or simply to rest.

Few animals are comfortable when eating or laying in close proximity of fresh feces. This condition would be especially true if the dairy environment is configured as HDF has designed it. When the tightly grouped mob of 100 to 300 dairy cows on one small 3-4 acre pod begins to download tons of fresh manure at the same time, and in the same area where they are grazing, when they have been exposed to a rain event for consecutive days and standing in mud till foot rot begins, when it is unseasonably hot for days, the irrigated effluent is ripe and flies are on them from all angles **what then is the remedy? Why is HDF not building a shelter for the dairy cows**? If for no other reason, income studies point out the significant added income when you have a "satisfied" dairy cow. Other groups including some civilized countries see this as humane. Be it your heart or your wallet she needs shelter**. Why is HDF ignoring this**

need? What shelter of any sort will be provided?? When more serious **storm events occur where do the cows go when flooding occurs?**

HDF has not shown an active concern for a shelterbelt location. Why not, and if they have one, how workable is it?

On Page 73 8.4.3.the Mahaulepu soils, particularly in the south central portion of the farm (Block F, figure 23) are perceived as "heavy, flood frequently, and difficult to crop." There are like soils with the same Ksat rating**. A statement that "they are "observed" as bring dry enough to graze even without a Kikuyu thatch" is below and begs any acceptable standard of verification. "Seems good -looks good" doesn't cut it so to speak. This is a critical factor .Where is the data? What does it say?**

Why did HDF state "the dominant soil types on the "lower farm" when actually these soils extend from lower Mahaulepu Rd 2/3rd or more, through the middle of the entire property, and poorly draining soil is the dominate soil type not just of the "lower farm" but of 352 acres of the property being used for grazing purposes? How does HDF reconcile the separate and different irrigation concept for Block F and not the other 300 acres composed of the same soil type (poorly draining)? Shouldn't the soil type define the irrigation method? These soils are group D soils (see: Department of Agriculture Natural Resources Conservation Service Part 630 Hydrology National Engineering Handbook Soils in this group have high runoff potential. " Group D. Soils having a very slow infiltration rate {high runoff potential} when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a ciay pan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission."

With soil type differences, different irrigation methods and nutrient limitations, has HDF successfully irrigated the kikuyu, and does proof of such successful trials exist? What is that proof? What trial data, date, and field location demonstrates the 18 day recovery

rate claimed and used to support the rotation of paddock at an 18 day level? What trial data of tests ran on different soil types at Mahaulepu supports that conclusion? Does the kikuyu yield, if any, match their indicated nutrient needs? How many acres of Kikuyu have demonstrated/met a 20 ton "kikuyu yield goal?" (page 57) What is the nutrient differences in Kikuyu and a mixture if Kikuyu-Guinea grass (page2-2 HDF Els PN)

On page 73 a mention of "drainage system" is noted. Keep in mind that any drainage/runoff of a grazing area is of an area covered by recently fresh manure and or effluent, the lower farm area is generally at 61 feet elevation, the effluent ponds are at an elevation significantly higher, the adjoining streams and drainage ditches run to the ocean. **With full understanding of what "zero discharge means" how does HDF explain why stream water pollution won't occur?**

Kauai needs development that adds economic security and stability. This HDF type intrusion on the south shore of the "Garden Island" is without precedent. The negative economic impacts possibilities stand out clearly in the light of studies from other CAFO areas. Never before in the world has any one attempted to locate a CAFO this close to an upscale residential, hospitality oriented, internationally known, ecological, archeological significant, and spiritual environment; one so highly rated that national park status is pending..

CAFO's can devastate the environment and human health. The presence of a facility like a CAFO reduces overall tax revenues. Assessed evaluations of land and houses nearest this industrial dairy will consistently

decreased by 20 to sixty percent in recognition of the loss of value that accompanies the odors, flies and other forms of pollution from the CAFO. Studies show that (Quote) "resulting losses in property rates are impossible to be made up from the new taxes generated by the CAFO for two reasons: first, a CAFO is specifically structured to minimize the amount of local taxes it pays and second, a CAFO is capable of polluting a substantial area around its perimeter and this area is likely to have an assessed value that far exceeds that of the CAFO."

The Hyatt employs a thousand people. This particular CAFO, by its own admission, offers 10 to 15 jobs, which HDF indicates in their proposal, may not likely be filled by locals. That point is reinforced by reviewing HDF hiring practices so far. The present HDF Manager is a former CAFO manager from Vado New Mexico; a dairy area noted as one of the most polluted in the state and one written about nationally. So far work has been mainly by New Zealand crews under the direction of an onsite general contractor from the east coast of the USA. If the measure of this concept is jobs created and dollars left on island to circulate among other vendors on the island, then what HDF brings economically to Kauai, can be replaced by a local, quarter acre sized, locally staffed "Dairy Queen Drive In" with no downside ..**Has that potential downside of this experimental dairy been examined? Under the principle "First do no harm" what are the factual assurance of "no harm"?**

Public Nuisance laws are being tested by this HDF dairy intrusion. The law regarding public nuisance is more and more focusing on industrial dairy intrusions. As their pollution affects are quantified there is a widening in definition. Legal interpretations often see this type of incursion as

unlawful, "an unreasonable interference with a right common to the general public, or an activity considered unreasonable as the gravity of the harm to the public right outweighs the utility (benefit) of the activity**. What case law is used by HDF to support their dairy incursion on already existing neighbors?**

HDF continues to reference water conduits other than the effluent ponds. On page 5 of their last know proposal, they speak of "water wells, reservoirs, irrigation ditches, drainage ways and culverts" On page 49 they speak of "existing drainage way." As previously noted, on page 73 is a mention of "drainage system." In addition 2 fixed cement water troughs per paddock would make 236 fixed water receptacles; all inside the effluent spray zones and within over spray/mist distance. It is understood why effluent ponds are required especially for close containment CAFOs, but in this new model, all the property not occupied with or by the milk parlor (570 plus acres) is a receptacle (a tilted to the South East, giant saucer if you will) for a manure and urine loading not consider nor regulated in Hawaii before. The Maximum load of cattle grazed at the HDF farm site from 1995 till now has been approximately. 300 range cattle, yet the streams running through the farm site and on to the ocean are polluted to an extreme with that load of cattle. (see Surfrider and DOH data). **What created this pollution? Could it have been from the cattle being pastured there?**

One fact must be emphasized**. I inch of rain per hour drops 27,154 gallon of rain on each acre. One local rancher indicated that "heavy rains in that area have started run off almost immediately". Obviously then-in this poorly draining soil- a "rapid rate of rain" fall** will also create flooding conditions. HDF clearly confirms the ranchers statement of

rapid rate of rain fall runoff (see page 73 Quote). **"With rapid removal of the "surface" water during and after a significant rain event'. –"rapid removal" of "surface water" "during"-- What other assumptions/interpretations can be made from their open admission?**

. A serious rain event could cause a certain overflow of the effluent ponds, but an unmitigated disaster would be occurring as 8 million gallon of manure laden water per inch of rain per hour, from the rest of the 574 acres remaining , will begin a down siope runoff to the ocean just 7 tenths of a mile away. No longer, as in cane or taro production, is it supposedly just a run off of muddy water. With 3 inches of rainfall on just the 352 acres of poorly draining clay soil you would have 28 million gallon of mixed manure and rain flowing off property. That figure is 17 million gallon more than the Exxon Valdez oil spill. (11 million gallon) spilling on a world renown reef and covering a 10,000 year old "Cave full of artifacts and threatened species" that simply can't be replaced at any price**...When using the 10.4 rainfall figure given by HDF and applied to 574 acre shallow dish catch basin as the farm property can be described. That full run off figure becomes a 168 million gallon run off from property. One rancher indicated that "water ran over the top of the farms four feet high fence posts. The EIS should consider the "prevent" wording of 344 State Environmental Policy. This data alone should factually support that this site is wrong and that the dairy belongs on a more suitable site. What information/data if any invalidates this high and statistically certain risk and of which HDF data confirms?**

I do not particularly "love" the dairy cow as the HDF spokesperson has indicated. HDF does (Quote Amy Hennessey "We love animals"-Jan

29/24 TGI.) but I do understand her (the dairy cow). Range cattle seem to move quicker than Dairy cows but the pace for both is slow. I have trailed cattle. I cannot conceive of a HDF workable concept that explains how to get a 300 cow mob up a raceway to the dairy parlor yard while 300 more need to leave that area and go back to the same pod they came from. I do not believe that the HDF paper concept will work under real life and varied conditions. At no time can you effectively have coming and going, intermingling mobs, cattle traffic. Such a stock traffic pattern would require clear fixed separation. It they must get one mob back to its pod before the next mob starts then the predicted time schedules are not close to real. If they use quadrant separation of the six daily required paddocks then the pivot irrigation concept is complicated at best...The outside perimeter distance of the paddock to the milking parlors appear to range between 200 yards on its west side just beyond the calving sheds to over one mile and a half south to Mahaulepu Road, It is, a mile to the northern tip and east edge of the farm. If a dairy cow is more than 900 yards from the dairy it will not work as indicated. Studies indicate the dairy cow pace at average is 1000 yards per hour. At this time there are range cows near the HDF property.. Borrow one from the Mahaulepu road area and trail it up to the milk parlor area at normal pace. Keep in mind the dairy cow would be carrying an average of 110 pounds of full udder weight also, wait for reasonable intervals (as long as it would take to get her washed down, milked, fed and back to the original paddock). How did it go, or better where did the time go? The stated maximum build out of 2000 cows will result in 4000 milkings,12 rotations, every 24 hours without interruption. **If one waits as described to get the dairy cow up and back before the next mob begin**

this rotation, how are the 12 mob rotations (to milk parlor and back) accomplished even under normal conditions? What data supports such practice?

The need for continual 24 hour full operation leads to the next concern. Very few dairies exist that brings so much varied power demands at such a constant high draw level. From electric fences to refrigeration, from automatic milking machines to roads, ramps, raceways lighting, paddock fencing, system pumps, such as those for the effluent ponds, and paddock watering trough systems; what happens when power is lost as it was 2 weeks ago (mid Jan 2015)? No separate backup power is mentioned in the HDF proposal nor could a backup generation system of normal size power up enough to handle the full electricity demand of this dairy concept. **In a major storm event-- power out over days- what will be done to maintain the viability of a sensible dairy operation? Do plans exist showing an off line from main provider secondary power source? What is it? How does it work? If the solar paneled roof concept is conceived as adequate to meet an offline from main source line need, then that data must be demonstrated re: a full and complete storage/ usage/ demand comparison. That comparison must be projected over the usual/common outages occurring in that area and for outage times reflecting major event disruptions. What data exists re: Photovoltaic solar Modules (solar panels): and high wind created loss of these panels by wind force? What is the possible wind load of that area of the farm?**

3rd Series HDF EIS PN Kauai Ronald John

Comments concerns and Questions-Kauai

What follows is additional information re: the HDF partial review and claim of a 100 year review by their Spokesperson and used to support the size of the effluent ponds. . It is an Example of content in a 2002 NOAA document: " 1950 Kauai: 52 in rain over 4 days, flooding."1957 11/30- Nina NNW, passed Kauai 92 8 21 35 Kauai: 20 in rain in 14 hrs, 12 homes damaged by $1,056,000 ----------(Chart 5)" (Atlas of Natural Hazards in the Hawaiian Coastal Zone
By Charles H. Fletcher III, Eric E. Grossman, Bruce M. Richmond, and Ann E. Gibbs Prepared in cooperation with University of Hawaii, State of Hawaii Office of Planning, and Natural Oceanic and Atmospheric Administration.

It is information too important to be ignored, left unfound or not used. It changes the parameters that safety and well-being requires. **Why has HDF failed to acknowledge in full all the weather events that would at minimum, significantly disrupt dairy production? Given the variability of weather patterns shouldn't all the full island weather conditions be taken into consideration. If not why not?**

If one analyzes just the Mahaulepu rain gauge data he will find 11 rain events that were 6 inches or more occurring in the last 25 years, If he reviews successive day rain events he will find 6 that were over 8 inches and which happened in the last 14 years. **If evaluated by approved objective evaluation standards, you would find that in each one of these 17 rain events (when applying only three known facts- soil type "poorly draining", 352 acre total, and Ksat level (O.00 0.10 or 0.20) Lowest ,average, or highest Ksat level shown-you will still have one result- flooding beyond the HDF property.**
. What evidence contradicts those findings?

On page 27 of the HDF proposal is a description of the 236 watering troughs HDF will use; "high enough for the animal to reach over and in but will discourage the animal from stepping in." A cow, at times, seems to become confused as to knowing which end they drink with. This has been observed as a good reason to not drink downstream from the herd. **Can**

this misinterpretation of which end should be next to the water trough happen in regards to the HDF water troughs?
Indicated is "refill the trough as the water is consumed." What happens to the water in the trough when the paddock is emptied and the water trough is full? "Does it then automatically drain (explain that mechanism) or sit full, partially full etc. and stagnate for the next 18 day rotation cycle? Can it be filled or emptied manually if the main power is lost or if some form of pollution is noticed in the trough? Even the best water troughs accumulates dust and other particles. Over multiple hot days it's not unusual to see a buildup of undesired elements. Who cleans the trough ?How and how often?
What set back footage figure from the troughs will be used to determined that overhead spray of effluent does not fall or be blown into the troughs? It is presumed the wheel tracks for the pivot system are set and not close to or encumbered by the fixed in place troughs? Are they?

On page 4-1 of the HDF EIS PN is the statement "identifies the region as important agriculture land for Kauai." It would appear that such terminology mainly represents the ability of the land to be use in flood irrigation type context i.e. a Cane or Taro field for example, or that the soil type was not considered in determining such IA designation. Grove Farms allowed a massive dumping of Class B solids by Aqua Engineers on land in close proximity to the HDF site. That is hardly an indication of "important agriculture land" consideration, and the meaning of such designation is flawed by the obvious granting of such use**. Why is this term seen by Group 70 as supporting this particular agricultural project and not more likely a PR attempt by themselves to favorably (not unbiased) represent HDF in this EIS endeavor?(Quote)"with high quality soil agricultural productivity ratings." Putting generalities to the side, what are the specific rating of this specific soil in this same area.** Perhaps Group 70 should recognize the meaning of the term "null hypothesis" and compare the Agua Engineer allowed use of the same land area as dumping ground for Class B bio solids near the proposed farm with that of HDF allowed use?

The HDF banner word is "sustainability." It is a buzz word; difficult to put fact based parameters around**. What in this situation does it mean? Is there any indication that HDF is going to lower price on their milk?**

Will HDF lower the price on the milk produced at Clover Leaf dairy presently being purchased by them as Mr. Whiteside has just done to his Big island dairy prices? Price of product is the problem and not sustainability. No situation can actually occur in the islands that cuts milk availability/sustainability which wouldn't also cut all other resources including power loss. **What alternate uses for this particular site were examined i.e. local food crop production for direct local use? With that use of Mahaulepu, it would be a true marker of one of many varied sustainability definitions.**

Under the summary of page 2 in the HDF EIS PN is a reference "establish the herd of dairy cow over several years" The initial 700 dairy cows arrive inseminate through a method of sex determined means, which generally produces more heifers than male calves. In addition to the first 700, and within a few short months, there will be 700 calves mostly heifers; likely 400 heifers plus in number. The new heifer in order to produce milk has to lactate and she will, along with the initial 700 dairy cows, calve within 2 years. This geometric progression is hardly "several years" but will be far beyond a 2000 head count in less than 4 and a half years**. What is gained with the " veiling of intent" "over several years" language.** It isn't a matter of depending on other conditions. It is what it is by nature of dairy cow breeding practice. Along with a maximum 2000 dairy cow operation come 2000 calves**. Other than the mention of "calf sheds" nothing regarding the bull calf disposal is mentioned but questions do arise. "Calves are moved into open paddocks after 3-4 weeks" Does HDF mean just heifers? Where do the male calves go? What contracts/terms exist between HDF and local ranchers for dispensing the male calves among them? Will they be slaughtered when born? For what reason and for how long are the heifers in the paddocks? Will they be contracted out and off site for repurchase later? This spin off second industry adds much more than just another grazing/ feeding concept. It requires far more than a one line statement .Explain all the factors, paddock space requirement, manure increase etc. that will be created if the heifer count is added to the mix of dairy cows being milked and dry cows totals. Have they been counted in the HDF total or is the HDF numbers given only for milk producing cows? At any one time after full 2000 build out, what is the general representative number of each category ie. milking cows ,cows that have recently given birth, cows with special needs, dry cows, close-**

up heifers, replacement calves and heifers? What number of calves does HDF accommodate with the calf sheds as described on page23 (new proposal)?

On page 30, a reference is made to drip tubing or tape. What irrigation expert or firm, and why would they indicated the use of drip tubing or tape as a method for an area where a 330 dairy cow "mob" will -in mass- be placed to graze for 22 hours on pod sizes from 3.04 acres to 4.03 acres? On a normal rain , with that load, damage or hoof penetration is likely. Was the fact that the dairy cow is walking in wet soils considered when selecting this unusual irrigation concept; one more sensible for row crops than a cattle grazing area? What dairy irrigation concept supports this method of irrigation under these actual conditions?

On page 54 3rd proposal- one reads "gun type application system to area outside the liquid effluent application" Those areas are on the fringe areas of the property .On page 54 Redacted and 3rd proposal HDF reference" the gun and their 65 foot radius of spray area will be moved around the paddocks" The first application method is a mounted end gun on the pivots, and the second gun system is hydrant mounted guns used in the paddocks. Some paddocks; almost the closest property to Mauhaulpu Rd will be covered by the first method. Use of the 2nd system gun system in other paddocks sets aside the assurances and claimed precision of the VRI system of irrigation. It is a wrong and primitive solution. It literally cuts corners and should not be allowed. It is a rare reader that has not been hit by wind-blown sprinkler spray or mist from a gun type application. Water ways are in its path (See page 32 (canal/ditch) running through the lower right corner of the property A gun type irrigation system spraying effluent will with wind drift create a combination of pollution either by odor, mist or both. It is a high error primitive system never used when sensitive areas must be protected. Its error rate is high and effluent scatter is at the whim of the wind. With sensitive stream areas near there should be no error variable in play. See as follows: and substitute the word "effluent" in place of "chemical "Western Agri Res Center PO BOX 1342 BLACKFOOT,ID 83221Performing Department

(N/A) Non Technical Summary
Application of chemicals with irrigation water is a widely adopted practice with center pivot irrigation systems, however, the standard practice of chemical injection at a constant rate results in systematic chemical application errors ranging from 7 to 22% for center pivots equipped with a corner watering attachment and/or an end gun" **Is this a important concern to consider? Does the application error mean amount of chemical (effluent) being distributed or include errors in pattern distortion? All solid research on sprinkler efficiency mentions "minimum of pattern distortion" What does that mean? What about" minimum" reflects zero distortion? Does it refer to distance as a variable not a fixed precise measurement ? What error variance was considered by HDF?**

It appears that the only set number given for off set allowance of a gun irrigation system use is refers to on page 96 2nd to last paragraph. That paragraph refers to "damage to structure" ie."Spread the effluent no closer than 50'feet from open water sources when applying liquid effluent with an effluent gun traveler. That system is defined as." The big gun" sprays a huge stream of water high in the air during irrigation, which is very susceptible to wind and evaporation losses - up to 30% or more in most cases. HDF has touted the new Zealand model, yet in "dairynz.co.nz-A farmer's guide to managing farm dairy effluent tells us" Some 'add on' effluent sprinklers to pivots i.e. guns have very poor distribution uniformity. **" What is different with HDF use of gun irrigation? Can the gun irrigation concepts be seen as a reasonable irrigation method for any area where water ways are close and boundaries are tight? What are considered appropriate set backs for each gun type. Why and What are these setbacks in feet? Has HDF indicated and defined what offsets and amount of property is within those offsets.**

What HDF usage is intended for the Canal/Ditch as show on page 9 and 32 (last proposal) and explained on page 7.

Can **HDF paddocks marked M and S (Manure and Sludge) on page 8 be used as a receptacle for sludge on these paddocks- at random- and receive an unknown level of Sludge on an "as needed" basis and still meet a specific nutrient application level for the paddocks involved?**

Given the now known soil conditions(see NRCS Customs Soil Resource Report for Island of Kauai Exhibit D), why has HDF determined a 20 ton Kikuyu yield is possible (see the "is Kikuyu" reference on page 56). What field tests support that yield level on all grazing pods or is it yet on a theoretical "hope for" basis?

Although "Kikuyu- Guinea grass" is mentioned in the HDF EIS PN page 2-2. It was never mentioned in the last HDF proposal. It is a different nutrient. Will the EIS review confirm this grass combination? Why would Group 70 have nutrient information not framed in the submitted proposal? Is it a typo? Should it have been indicated earlier? How does that affect all other nutrient data? What other changes have been made in the basic parameters of the dairy concept? Will all changes to their last proposal be made public and in what manner? What agencies are now aware of the changes?

HDF EIS PN Kauai Ronald John

Fourth series of comments -questions and concerns

Quote--page 51- first HDF proposal. "The higher altitudes that feed the reservoir from (Waita) receive very regular and very large amounts of rain." From the center of the Waita reservoir to the HDF milking parlor is 3278 yards. The highest part of the mountain range behind Waita reservoir and Mahaulepu is to the NNW end corner of the Mahaulepu property and approx .2200 ft. Haupu at the NNE is 2600 feet. In the above sentence is the admission of "very **regular and very large amounts of rain." In what manner is this large amount of rain (coming from the high mountain range surrounding the HDF property- and inside a Horseshoe fashion)-kept from running through the manure covered field directly into ditches and streams traversing the HDF property .Will surface runoff occur ?Does this downhill run off end at the ocean. Was this known? Was it planned? If not why was this certainty ignored?**

Quote: "It is commonly believed from recent history that Kauai lays in a more vulnerable position than the other islands. However, in his recent analysis of Hawaiian hurricanes, Dr. Tom Schroeder of the University of Hawaii, Meteorology Department, concludes that every island has been affected by hurricanes and that no island is without risk. The randomness of nature plays a key role in which islands are at highest risk during any given hurricane. In 1988, Hurricane Uleki was poised to hit Oahu or Maui but passed to the south. Hurricane Iniki in 1992, could have hit Oahu or missed the islands altogether, but instead tracked right over Kauai"(Quote) Atlas of Natural Hazards in the Hawaiian Coastal Zone. By Charles H. Fletcher III, Eric E. Grossman, Bruce M. Richmond, and Ann E. Gibbs prepared in cooperation with **University of Hawaii, State of Hawaii Office of Planning, and National** Oceanic and Atmospheric Administration Geologic Investigations.
Series I-2761

One of the most significant factors protecting adjoining areas from pollution or over run from effluent ponds is the gallon capacity of the ponds. Federal

regulations have guidelines and compliance expectations that must be meet. Serious questions have been raised and DOH has sent HDF back to the drawing board for a redo of their effluent ponds capacity. The size and manner of construction is predicated on many factors one of the most prominent is the history of weather events that would create a breach of the ponds. A 24 hour 100 year review of storm participation was offered as proof of compliance by an HDF spokesperson 23 January 2015 (Quote Amy Hennessey Jan21/15 TGI) "Our farm's effluent ponds are designed beyond the requires size to accommodate a 24 hour 100 year rain event." HDF uses the figure of 10.4 inches in a 24 hour time frame.

If only that was true- for their sake if nothing else-, but it isn't true.

A 100 years recap would take too many pages to outline this concern but just taking the high points of the National Oceanic and Atmospheric Administration data from1950 till 2000 (50 years) will point out how much defining data was ignored or left out by HDF. Specific to Kauai: was Hurricane Hiki in 1950 with 52 inches falling in 4 days, Nina in 1957 with 20 inches of rainfall in 14 hours, Dot in 1959,with the eye directly over Kauai, Iwa in1982 with all gauges down- listed as Heavy rain, Iniki In 1992 all gauges down- listed as Heavy rain (9inches at least). **If anything was left standing including dairy cows these Hurricanes would have filled the ponds and quickly brought them to an overflowing, runoff stage. What data supports otherwise?**

In regard to the endangered shearwater bird much has been said but until recently not enough done to protect this endangered species. A brief chronology follows:
"Hawaiian County Agrees to Pay Restitution and Modify Operations to Resolve Endangered Species Act & Migratory Bird Treaty Act Violations"

HONOLULU – The county of Kauai, Hawaii, has entered into a plea agreement to resolve alleged violations of the Endangered Species Act (ESA) and Migratory Bird Treaty Act (MBTA), the Justice Department announced today. The county today entered a plea of guilty to violating the

MBTA by taking That is killing or wounding, more than 18 migratory birds, specifically Newell's shearwaters (known in the Hawaiian language as 'a'o).

The Newell's shearwater is a threatened species protected under the ESA, and a migratory bird protected under the MBTA. The species is identified as endangered on the International Union for Conservation of Nature red list.

"According to the information, it has been publicly documented since at least 1979 that fledgling Newell's shearwaters are attracted to bright lights which often causes them to circle the lights and fly more passes across any nearby obstacles. This attraction may cause the birds to fly into the light or other obstacles near the light and thereby become killed or injured, or to fly around the lights until they fall to the ground exhausted where the bird may be killed by a car, predator or starvation." On approximately Aug. 3, 2005 and Sept. 16, 2005, as well as on various other dates thereafter, the county was notified by the U.S. Fish and Wildlife Service that its facilities, particularly the lighting at its facilities, were taking protected seabirds, including threatened Newell's shearwaters.

The county was given advice over a number of years that it could minimize takings by, among other things, shielding its lights.

The information specifies that during each of the past five years some Newell's shearwaters have been killed, or otherwise taken, by lighting at facilities operated by the county.....

. Starting with the 2011 football season for any night games all lights must be shielded and a similar escrow account funded.

LIHU'E — County officials announced Friday that work crews are in the process of manually re-activating the exterior lights at all county facilities to allow nighttime activities to resume.

The lights were manually disconnected just prior to the Newell's Shearwater fledging season from Sept. 15 to Dec. 15 to eliminate the sources of light attraction as part of a plea agreement between the county and the Department of Justice.

The only exceptions allowed were four evening Kauai Interscholastic Federation fall football games.

Other mitigative measures taken thus far by the county to protect Hawai'i's threatened and endangered seabirds include: installation of shielded lights at Vidinha, Kapa'a and Hanapepe stadiums, Isenberg Park, Peter Rayno Park and the Lihu'e tennis courts; training on the cultural and ecological importance of the seabirds and bird-friendly practices for all county employees; and a monitoring program with respect to endangered seabirds.

At all other facilities, the lights must be inventoried and measures must be taken to minimize and monitor for takings, all on a specific schedule. As of 2011, if such facility lights are to be used at night during the fallout season (Sept. 15 until Dec. 15), an escrow account of $100,000 must be funded, with an option to add additional funds in increments. Again, transfers would be made related to any takings that occur, from the escrow account to one for use to benefit seabirds on Kauai. If and when the fund is exhausted lights at facilities with takings cannot be turned on at night for the duration of the fallout season.

The plea also provides that the county will make a payment of $180,000 to partially repair the harm of past takings to an account to be established at the National Fish and Wildlife Foundation for use to benefit protected seabirds on Kauai, and a payment of $30,000 to reduce the harm from anticipated future takings. within the period of probation and prior to the county acquiring an incidental take permit, to the Kauai Humane Society to augment its Save Our Shearwater program.

"The Department of Justice views the taking of protected wildlife as a serious violation of the law, and we are pleased that the county of Kauai is taking action to reduce the risk of harm to this threatened seabird," said Ignacia S. Moreno, Assistant Attorney General for the Justice Department's Environment and Natural Resources Division. "The county's action will enable residents to continue to use county facilities, while protecting this native species that is part of Hawaii's cultural and natural heritage."

The Endangered Species Act prohibits the unauthorized taking, including harming and harassing, of species listed as threatened or endangered. The Migratory Bird Treaty Act prohibits the unauthorized taking, including wounding or killing, of bird species listed as migratory.

The case is being prosecuted by the Environmental Crime Section, Environment and Natural Resources Division, U.S. Department of Justice.

The TGI on 29 Jan 2015 publishing a concluding cost to Kauai for lighting correctly and taking in the full needs of the shearwater at One million Nine hundred thousand dollars.

HDF is aware of the high numbers of Shearwaters nesting and flying in the Mahaulepu area of the farm. They are aware that the amount of lighting needed to effectively run the dairy through the night is high. They know they have a night lighting conflict. That conflict of needs must be resolved before or ever the lights go on. It requires a much higher response level than "were working on it " or "we care for the shearwater bird." What by detail is the HDF plan to protect this endanger species? If "shielding" is a remedy what exactly does HDF mean by that term? Describe in detail intensity, glare, range etc. Does the plan met the compliance standards now agreed upon by the county?

How can HDF have lighting bright enough for cows to walk safely each way from a pod, as much as a mile and a half in night time dark conditions, a lighted milk parlor area, a lighted surrounding area for other related activities, and at the same time, protect the endangered shearwater bird as legally demanded?.

The Mahaulepu area is known for gusty winds. Kite flying is a noted activity in this area. In this type weather, stability of a non-fixed or un- tethered object is at risk. In 2014 and on HDF Mahaulepu property a full pivot system blew over. The weather was of a moderate storm condition with wind gusts. This incident is fully known by the HDF farm manager Mr. Garmatz, and the New Zealand crew that was assisting construction at that time. This pivot system is a large, tall, 2 support wheel configured, and

heavy system of the capacity to cover over 100 acres in a 24 hour time span. This full "tip over" if occurring while spraying effluent would have created an uncontrolled spill. No shut off system reacts on a zero time elapse basis. All VRI systems have an error dimension. **What, if any method exists, stabilizes this pivot system when a large random gust hits it? As this system is susceptible to wind gusts when they occur, if operating even if it only is moved, flexed or tilted, from the intend direction, effluent spray will be emitted in uncontrolled and unintended directions. How are the streams protected? Does the farm manager confirm this wind gust blow over incident? Would this type spill be considered under "In Case if an Emergency Spill Leak or Failure during Transportation or Land application"(see proposal page 100)? Why wouldn't these type spills be seen as a continual factor of use or a certainty over time not an emergency spill or accident? What is the upper HDF numerical limit of wind force uses to determine nonuse of the effluent irrigation system? The average yearly wind factor for Poipu is 16.2 mile per hour. It is higher at Mahulepu.**

Pivot 1 has a pivot range as measured by Google Earth 27 D ec 2013 from approx. 130 feet at the top North arc point to approximately 70 feet to the lower edge of the pivot circle. **Application measures of effluent put down during one rotation appears to be beyond the intake capacity of some soil types . Will the EIS address this issue? What consideration is shown for up slope run off?. As these applications occur quickly does data support this method of application? At what rate? Will the EIS address the slope issue as it relates to rapid run off rate of effluent, irrigation water or rainfall creating stream pollution?**

HDF- EIS-PN Kauai-- Ronald John-

5th series of comments-questions and concerns

"Findings and Recommendations Natural Disaster Survey Report
Hurricane Iniki
September 6 - 13,1992
Chapter 1. The Event and its Impact
Finding 1.1
"A small but intense hurricane struck the state of Hawaii during the afternoon of September 11, 1992. Although all islands felt the storm, the islands of Kauai and Oahu were most impacted. Seven persons were killed and about 100 injured; total damage was about $1.8 billion. The south shore of Kauai near Port Allen took the brunt of the storm with wind gusts measured to 143 miles per hour (MPH) and water levels (a combination of storm surge and waves) nearly 30 feet above normal.
Finding 1.2
Because of the apparently weak construction of many buildings, estimates of wind speed based on building damage may be unreliable. Estimates based on other indicators showed sustained winds of 130 to 160 MPH especially in areas where winds are enhanced by terrain.
Recommendation 1.2.1
The NWS should encourage the State of Hawaii to review its building codes in light of the Iniki damage ".
Coastal Management News page 1: HAWAII INCREASES RESILIENCY THROUGH HURRICANE FORCE WIND BUILDING DESIGN STANDARDS
Page 2
"The Federal Emergency In reference to Management Agency (FEMA) supported the technical work for Oahu and Kauai. By mid-2008, all wind speed studies were completed and transmitted to the State Building Code Council (Council) and offered as technical amendments to the 2006 IBC. HCZM participated in this effort by helping to draft legislation that established the Council and serving on the State Building Code Committee, a predecessor to the Council. HCZM provided key testimony to the council, requesting automatic adoption of the wind standards as a part of the county IBC adoptions. The Council adopted the wind standards for all four counties in its final draft of the State Building Code (entering public review later this year), and required each county to use their specific wind

standards no later than two years after state adoption of the State of Hawaii as a Special Wind Region."
Were all HDF buildings including calving sheds, silo storage and feed storages reviewed and approved to meet these wind standards? What compliance data was given. If none please explain. What amount of wind speed/wind load were these structures approve to withstand?. Are the approving agencies deliberations and recommendations on this matter readily open for public review? Who approved them and when?
This dairy is an experiment. As so, it would require a specific set of contingency planning/ back up for a wide variety of events which might occur. **Fail safe backup assurance if you will. 30% of nutrient needs are provided by supplemental feeding from automated silo to trough feeding. .Electricity is required. The best of machinery breaks down. Then what**? In the ranch area I came from and based on prior experience those type needs were anticipated and set asides- be it hay or grain or other- were available. One can't recall a government subsidy program, as exists now, that made up for poor planning. Unusual weather occurring was a given, not an accident or emergency.
. In a larger purview ie. docks close, on island provider of nutrient supplies shut down; what is the time limit when this nutrient expectation can be meet without relying on off site delivery of additional feed supplies? Where does that restocking come from? These are just a few examples of an imperfect world.
Ulepono Initiative principal Kayle Datta, in an opinion posted in the Garden Island Newspaper 15 Feb 2015, used a California dock strike as an example of the need for their Hawaii based dairy**. Wouldn't such shut down be more crippling of a nutrient plan that require 30% of their feed from a state side feed source. If that USA dock strike became a real problem there are New Zealand dairies with milk to be exported. Can they also take care of HDF feed source needs?.**

No one is against sensible, data supported, properly sited and sized dairies. That definition does not support the HDF dairy concept nor it being sited at Mahaulepu. **What are HDF's fall back positions? In detail, what major problems could disrupt their ordinary procedures? With full 24 hour operations required, what company, factory, assembly line or any other system didn't at some point breakdown? What amount of down time can HDF handle? What is the remedial action for electrical**

systems outages or mechanical problems? The HDF concept requires a high number per hour milking count. Who milks the cow when the milking machine is off line. When the back up solar power system becomes inoperative or depleted then what?

The mention by HDF re: wind break" or shelter belt as defined in NCRS Code 380. as being "a multiple row planting of trees will be established…page 57)" begs the full meaning of this concept .No effective relief is gained by the limited HDF treatment of this requirement, nor does it appear there is room for such planting**. The primary wind direction in that area is from the NNW .Where then should a odor minimization wind break be placed? This area is a large concern being treated with little regard. A serious odor mitigation plan must be required**. **What is that plan?**

The Clean Water Branch Brown Water Advisories are part of the information that would validate runoff problems of the HDF site. Most of the source of that condition in the ocean waters of Mahaulepu Beach comes from streams or ditches traversing the HDF property. This condition is frequent and has existed for years when flood irrigation was the method of irrigating the Mahaulepu Cane and Taro fields. The beginning of the now certain polluted level of the brown water is not known. Those who visit the area know of the long history of brown water there, Many have filmed it. If proof of the now existing and continual runoff displaying the polluted ability of the HDF location is necessary, then rainfall data should be available. The TGI stated in an article titled "All Washed Up" (9 Dec 2013) "According to the National Weather Service Poipu registered 4.33 inches and Kalaheo had 3.76." This was of a condition of just a week before the article and when there was an abundance of brown water in the ocean off Mahaulepu Beach for multiple days. **From the data of Surf rider at that time, to the most recent findings of DOH it is definite that the "brown water was and continues to be highly polluted .Will this evidence be considered in the EIS examination of pollution issues?**

Question arise regarding the intensive "grubbing, grading, planting ,and major alteration of the landscape. ,New ditches and other trenching were began and finished before permitting. In a jump start and confident mode, it appears that HDF proceeded to do much of this type work before permitting was approved. Google Earth close up imagery Dec 17 2013 show an

intensive amount of field work completed over a third at least of the property from Mahaulepu Rd for approx.1800 yards north toward the back end of the property and west to east at a max point of approx. 800 yards. Planting efforts are shown and water channels have been already cleaned or created. It appears that added and improved roadways have occurred by December 17 2013**. Heavy grading is noted. In addition, field trials are mentioned as having been performed earlier than the permitting date. Under what permitting statute were all the alterations allowed, and at what date did such permitting allow HDF to begin active alterations of the site? Was Grove Farm/or the planning approving agencies aware of the extent of the activity? Does this possible pre-authorized beginning of construction explain the measured significant increase of nutrient, bacteria and sediment in the Waiolopi Stream?- pollution far in excess of state standards-and occurring in higher numbers as they began "work" on the property? Does HDF acknowledge significant pre- permit and present activity beyond statute limitations**? **What agency onsite inspections have been made-by whom and when? –Was compliance to HAR11-55-04 shown? Was a storm water NPDES permit obtained? On what date was it applied for? What dates was it issued? If not seen as needed- Why? Cite the statute that allowed HDF to disregarded HAR 11-55-04.**

What "reclaim" or clean up regulations for building on previously contaminated /pollution laden sites prior to subsequent building and commercial use (even if by an ag related industrial endeavor) are required by federal, state or county requirements? If the present levels of measured pollution levels are not first mitigated, increased runoff and contaminants from the HDF addition of a significant higher level of possible pollution would be added to the present volume and level of pollution now being found. **One would image the Clean Water Act is also involved. Please determine, review and list all "clean up rules covering site use of this existing polluted property." In this regard advise if compliance to that standard requires the HDF property to be pollution free before beginning. If not- why not?**

It appears that the definition or perhaps the difference between point source discharge and non-point discharge is blurred by this new and larger expansion of on fields use of excess manure. HDF has attempted to show its need by data supporting effluent pond use for this concept. What isn't a

matter of opinion is the dumping of sludge on the M and S (Manure and Sludge) 82 acre Area at the lower left hand corner of the farm (less than 750 ft east of the Koloa Public wells).

HDF is a CAFO as designated by 40 C F R paragraph 412.15. The Clean Water Act 33 U S C in part would assert that this dumping of sludge at least would be in violation of this Act if not by its "storage use" i.e. "not needed" or "an addition beyond usage" but for the certainty of comingling polluted water with that of the Taro Farm. The Taro Farm located at the very bottom of the HDF farm site could become a convenient dumping area for effluent over fill or catch basin for surface water, and then the subsequent drainage to the Taro farm ditch system would run to the ocean (one source removed) as part of their operation.

Grove Farm has shown little hesitancy in removing tenants from areas need by a bigger tenant. The small approximate13 acre Taro Farm as located, stands out as abutting and surrounded on three sides by HDF property. It is conspicuous by its presences and also by its disregard in HDF planning. That so termed private property requires flood irrigation yet abuts a sludge containment area containing 82 acres. Block F of 54 acres which is described on pp. 73 " are perceived as heavy, flood frequently and difficult to crop is also next to The taro farm. No indication of protection or concern for the Taro Farm is written, and runoff, over spray or intermingling of its water with effluent mixed water was not considered.

The Taro farm abuts Block F described as **heavy, flood frequently" "characteristically poor draining. This location raises not just interest and suspicion but justifiable questions. A written description re: the interaction, terms, and considerations made between Grove Farm, the Taro Farm and HDF needs to be examined and explained. That relationship should be clarified, including what barriers exist which would stem overrun either in or out of the Taro Farm. In that regard there should be provisions outlined in the HDF proposal for involving or protecting the Taro Farm from any type disturbance or incursion. What are these provisions .If none exist- Why not? What should be done to consider/ protect the Taro Farm?**

There is a high degree of confusion regarding whether the nutrient data, waste management data etc. is for the ultimate build out of 2000 dairy cows Section 11-200-7, HAR, states:

"A group of actions proposed by an agency or an applicant shall be **treated as a single action when**:" The component actions are phases or

increments of a larger total undertaking. A proposed action must be described in its entirety and cannot be broken up into component parts, which if each is taken separately, may have minimal impact on the environment. Segmenting a project in this incremental way to avoid the preparation of an environmental impact statement is forbidden". **Are all elements of the plan developed on the basis of full build out parameters? Wouldn't all other action need to wait until the "larger total undertaking" is sent through review and permitting protocol?**

The geometric progressive buildup of calving from the initial 699 dairy cows will build quickly to 2000 AUs (Animal Units) on HDF property. Obviously an increment of heifers and bull calves, by that process will be grow progressively larger and reach the 2000 mark within 5 years. The next calving cycle beyond 2000 (14 -16 months) will progressively expand the number by that full 2000 amount. HDF will either sells or uses the heifers for additions dairy production. It will also be producing a high number of male calves for sale**. There is no indication of calf pen size enlargement or additional excrement from the calf pens into the effluent pond or additional excrement on the paddock when paddock containment is being used for heifer calves. The excrement of calves both in calf pen and on paddock must be represented. What are the amounts considered? Are they shown in the present proposal? That information affects all HDF computations from effluent pond size to nutrient plan. What is the procedure to cap the total number at 2000? Does that 2000 number include calves, yet lactating heifers, and dry dairy cows? The proposal as written is unclear and unacceptable without more definitive clarity on these multiple issues.**

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No mention of "dry dairy cow" or "sick dairy cow" is given. Where are they pastured? Are they moved from paddock to paddock? Are they separated and how? Other than the one line on page 91 (last proposal) "Animal Mortality Management Plan",. no mention of a necessary veterinary space location or the cleanup of such area is given.

Recently legal findings were made re: Kauai Bottling Company right to use the Waita reservoir water for commercial sales. Grove Farms testimony is through out some of the narrative. Pioneer has a claim to water (page 31 first proposal) from the pipeline water also used by HDF. If more is needed

by Pioneer HDF would have to acquiesce to their usage of the pipe line water usage if necessary. Quote pp 31 " the pipeline is unlikely to be able to supply required water for irrigation when Pioneer is in full off take." **The possibility that future legal action could cloud the entire water use of Waita reservoir use is evident.. This must be recognized in an EIS review and a consideration if HDF planning. Has it been? In what manner?**

Little if any data used to support the present concept is usable to support a Confined CAFO conversion or to start initially as one. See 2-3 HDF EIS PN What factors supports this alternate as a" viable" one? Why?

Page 5 -1st proposal under Design Consideration indicates "Cow races need crossing solutions(culvert and bridges) at three points over the stream which passes through the dairy farm" **No explanation of how the stream is protected from manure and feces deposited while traversing these cross over points exist. Are protective side curbs on these direct outlets provided? Both, at the approach to these culvert and bridges while on the bridges and at exit points, would require side barrier containment? Where does the excrement during these crossing go and how is it contained?**

There is a freshwater "Lake Pond" abutting the HDF property line (upper left corner and on pp20(Redacted proposal) shown as discharging into a "canal/ditch" traversing the property and then leaving the property just above the area marked milking parlor at pod **105. No protection of that ditch from pollution from the cited gun style (65 feet range)effluent emission spray or other excrement spillage is given. Why?**

Given a 2000 number of perfect automated cows and perfect systems working at max level, the time to transition a mob of 300 cows both up to the milking parlor, milk and feed, and back to that same pod relies on human workers and with that less than perfect variable, it is questionable that all the perfect cows could be milk in the time required for 2 milkings per day. Add in the slow walking dairy cow of reality, carrying a full udder of an average 110 lbs weight as she goes to the milking parlor and down time becomes a serious draw back of a scheme based on what might work for at a Confined CAFO setup. No rancher nor any one who has trailed cattle

would tell you otherwise. If two mobs are grazing on pods near one another you can not get the first of the two mobs of 300 back to its same pod (most pod distances are at least 800 yards from the milking area and many a mile away) while at the same time bring the next 300 cow mob up the same raceway. **This is not "3 little pigs going to market", but 300 dairy cows strung along "walkways and races" 16 to 20 feet in width (page 21 last HDF proposal) and often in poor, sloppy, weather. This concept won't work .At this time a reality based plan must be defined and explained. What is that plan?**

Waste Utilization-Field Office Technical Guide NRCS
Section IV
Where the residues of energy production are to be land-applied for crop nutrient use or soil conditioning, the criteria listed above shall apply.
CONSIDERATIONS
The effect of Waste Utilization on the water budget should be considered, particularly where a shallow ground water table is present or in areas prone to runoff. Limit waste application to the volume of liquid that can be stored in the root zone. Agricultural wastes contain pathogens and other disease-causing organisms. Wastes should be utilized in a manner that minimizes their disease potential. Priority areas for land application of wastes should be on gentle slopes located as far as possible from waterways. When wastes are applied on more sloping land or land adjacent to waterways, other conservation practices should be installed to reduce the potential for offsite transport of waste .It is preferable to apply wastes on pastures and hay land soon after cutting or grazing before re-growth has occurred .Minimize environmental impact of land applied waste by limiting the quantity of waster applied to the rates determined using the practice standard Nutrient Management(590) for all waste utilization. Consider the net effect of waste utilization non greenhouse gas emissions and carbon sequestration. "
It is difficult to examine the HDF proposal and find realty based concepts that effectively meet these NCRS criteria. Some of the NCRS criteria have been simply ignored in the HDF proposal, and that is a significant concern. By field elevation data obtained from Goggle Earth one finds a number of varied field level elevations within the overall 100 ft elevation decrease extending from the northern most end of the HDF property to Mahaulepu Road. Measuring across the fields- West edge to East edge- multiple

undulations are noted and as varied as 60 feet. These elevation are readily verifiable by Google Earth. **The underlined and stated issues above are not addressed properly. Some are skewed outside the stated parameters, others are ignored. Shallow catch basins and pivot movement obstructions are apparent. "Consider" was never meant as being "were thinking about it." The EIS, for purposes of clarity deserved by all, ,must clear up all the generalizations and non descript vagary.**
The HDF proposal should have been characterized by and recognized as displaying appropriate data based planning. It does not meet that threshold of examination. What group of agriculture experts would sign off on a "full blind review" of this proposals content ? None of many shown this proposal, even with "Group 70" displayed on the cover ,found it of reasonable content.. In what manner and by what data are these concerns now explained and addressed? NRCS had clarified in writing that <u>they did not</u>, as claimed by HDF in public presentations, PR press releases, and written communication and in multiple time in each manner "Approve" the proposal. It is evident also that NRCS was too quick and not thorough in their examination of the proposals concepts and support materials.
These issues must be resolved in a professional, detailed, thorough and reality based manner. Rigorous examination of such serious issues is essential and required. A concrete data based explanation of all the above underlined requirements is requested by line item evaluation. It should include but not be limited to field elevations and drain slope numbers." Have Faith" or "Trust Us" is not the review standard nor in matters such as this, will promises suffice.

On page 12 and 13 last proposal HDF identifies the predominant 3 soil types on the HDF property as "Poorly Drained." 8 soil types, though significantly smaller in acreage size, are identified as "Well Drained" One soil listed as rRK is listed as "Well Drained although shown as having a 0. 00 to 0.06 Ksat capacity and identified as 'Rock Land. **On page 64 these soil types are bundled into 23 CMUs (Conservation Management Units)These CMUs are used for nutrient planning purpose yet many are of different total sizes, have within them different Ksat levels and varied soil types. How does HDFs nutrient plan successfully accommodate these differences? What is**

the expected procedure in this area? Will the EIS review process examine the question of whether nutrients overwhelm the absorptive capacity of the soil, and either run off or will be leached into the groundwater? The maximum allowable rate of application (inches per hour) to prevent runoff depends on the intake rate of the soil. This basic underpinning of application rate is continually conflicted by HDFs own indications. Will the EIS review this specific compliance need?

Conspicuous by its presences and also by its disregard by HDF planning is a Taro Farm in the lower left hand quadrant of the property This private property requires flood irrigation yet abuts a sludge containment area containing 82 acres and block F of 54 acres which is described on pp73 "are perceived as heavy, flood frequently and difficult to crop. **No indication of protection or concern for the Taro Farm is written, nor is runoff, over spray or intermingling of its water with effluent mixed water considered in the HDF proposal. Why not? What should be done to protect the Taro Farm?**

HDF on page 73 explains Block F-Special Management. They restrict the Block size to 54 acres. Abutting and continuing north of Bock F are Pod 211 through 218 and still connected farther north include Pod 121 through 124 and to their west Pod 101 through 104. All these connected and additional pods are of like soil types. **Why is the total area of connected like soil i.e." <u>heavy, flood frequently" "characteristically poor draining</u>" treated in a different manner**

HDF EIS PN- Kauai- Ronald John
6th series of comments-questions and concerns

A general rule but specific to the HDF flow of multiple proposals is: "When a significant and substantive change or changes occur in a proposal document creates a significant and substantive difference in the body of the proposal (multiple data points/factors) the entire approval process must begin again." **Was West Kauai Soil and Water Conservation District notified that the proposal as presented contained directly opposite soil ratings? After that acknowledgement did West Kauai Soil and Water Conservation District approve and NRSC examine the most recent proposal? What actual data should have been considered by these agencies? What adjustments did DOH have to make when the true data was given to them?**
There is a conflict by nomenclature misrepresentation implicit in The HDF statement page 7- 2.2.1 Quote "The drainage ways within Mahaulepu Valley and within the project-------these canals and ditches flow—There are other water ways than ditches and canals on this property, HDF calls them **"unnamed drainage way" Why wouldn't they know the names? Actually two historical streams (Kapunakea and Wailaau) consolidate into one and enter the class A ocean at the end of Mahaulepu Beach near the Makauwahi Cave Reserves. The HDF type of generalized terminology is replete throughout the proposal and should be noted and considered in the EIS review**.

In earthquake planning for retrofitting or design of new buildings the terms "worst case scenario" or" significant events" are primary to setting the parameters to be met. From Waste management through Nutrient plans HDF appears to misunderstand that basic protective need. .HDF proposal language speaks in terms of "average" There is nothing precise in that term. Words like "assume" have no place nor is a sensitive, critical factor presented as "observed. "Average" is not "actual." "Average" is an artificial indicator of a wide bandwidth of conditions not one specific condition only. **You do not develop plans for developments such as an experimental dairy project based on average, generalizations, or probability but build on a standard of "possibility of" and specifics. Does HDFs proposal content met that necessary threshold and does EIS reviewers see this specificity as necessary?** The bar of acceptance for

approving the contents of their proposal data would be below any normal standard of acceptance if a dairy design of this nature was given a permit based on such loose linguistic presentation."
. When specifics are given such as page 39 first proposal- sentences like "Buried pipe will be installed at sufficient depth below the ground surface to provide protection from hazards by traffic loads, farming operations freezing ,temperature----"this level of document preparation speak of ''cut and paste" and no attention to content applicability. **"Freezing temperature"** this after 5 years of studying? This parameter for a Hawaii based dairy farm**? Isn't specificity and accuracy required in proposals of this nature? If anyone is to find legitimate support for this project, conclusory assertions must be replaced by data and that data being interpreted correctly. At this time the deficits in HDF's presentation are obvious and if left to stand unacceptable. It is a seriously flawed attempt pointing to little academic discipline and an abundance of unconcern. What should/can be done to gain the precision required? In itself this proposal is as flawed as its concept, and by its self should be rejected. On what merit is this proposal deemed acceptable by any objective reviewer?**

What can one determine from the admission of Quote pp. 53 first proposal? "Water application will be at rates that minimize transport of sediment, nutrients, and chemical to surface waters, and that minimize transport nutrients and chemicals to ground water". From "establish and operate the first zero discharge grass fed dairy" in next breath to "minimize transport" to surface waters and ground water. Is this admission not clear in its intent? Minimize does not enhance nor describe compliance to "zero discharge. " What does minimize represent to HDF? What outcome is unclear in that admission statement?

The continuous effluent bath of the pods already holding a significant amount of fecal material will over time significantly affect the water systems and ground water. **That is a certainty as is the eventual**

nonproductive capacity of the soil. Why is this ignored? What information or data in the proposal support a different conclusion?

Quote New Zealand Dairy Farm Guide "Sloping land (>7°) or land with hump and hollow drainage refers to soils which are gently rolling to steep. Also includes soils which have been humped and hollowed. The main risk is runoff on these soils. Management tips: application depth must be less than soil water deficit and application rate must be less than soil infiltration rate" **Page 12 HDF proposal lists 7 of the soil types having slopes in excess of that rule. What does HDF do to rectify this discrepancy in irrigation concept? Was humped and hollowed contouring done on the HDF property? Were contours sloped toward the water outlets when grading was being done? What contour maps were used during the grading of the HDF property? What contour changes were made? Prior ground elevations are available on Google Earth. What does present satellite imagery show?**

The HDF pivot system is a large, tall, 2 support wheel configured, heavy system of the capacity to cover over 100 acres in a 24 hour time span. The full "tip over" of 2014 if occurring while spraying effluent would have created a uncontrolled spill. No shut off system reacts on a zero time elapse basis. All VRI systems have an error dimension**. What, if any method exists, stabilizes this pivot system when a random unpredictable gust hits? As this system is obviously susceptible to wind gusts when they occur, even if only moved, flexed or tilted, from the intend direction, effluent spray will be emitted in uncontrolled and unintended directions., How are the waterways protected? Does the farm manager confirm the 2014 wind blow over incident? Would this type spill be considered under "In Case if an Emergency Spill Leak or Failure during Transportation or Land application" (see proposal page 100)? Why would the 2014 blow down not be seen as a factor common to its use not an accident? What is the upper HDF numerical limit of wind force uses to determine nonuse or "stand down" of the effluent/ irrigation system? The average yearly wind factor for Poipu**

is 16.2 mile per hour. It is higher and more varied as you go up toward the mountains. What are those readings?

What are the weight and size dimensions of the pivot system wheel sets, their width and weight per unit? How many wheel systems per pivot and what is the total weight load on an individual wheel section when in full operation. What is the distance to the outer gun system and what is the tracking speed of the outer pivot? Wheel rutting is common to all pivot systems. It is more so when one is as large and heavy as that HDF is using. What are the single wheel width and weight dimensions? Within a short time of use distinctive tracking/rutting paths will occur. When either prepped as a hard surface or becoming one when in the clay areas of the fielding- how will rutting be prevented and runoff not occur from these tracks? As these tracks become fixed, permanent pathways, they will become quickly visual and distinct. They will become multiple miles of circular conduits where any irrigation water or effluent can be carried away. These certain depressions will either hold or runoff to other areas .If the tracks are hard surfaced by design then they now become pathways/walkways, much as raceways etc. They, by known function, become "discharge" areas. If untended they will, if not hard surface designed, become depressions holding standing water in stagnating pools. If accessible, animals of all types drink from them. As much or more than walkways raceways etc. these certain channels must be considered and runoff to them and beyond controlled**. Will the EIS address that need?** There **is considerable fluctuation of elevations determined by Google Earth Dec 2013 which not only impedes a pivot system but can as well stall or shut one down. What is the shutdown emergency reaction time? Why did it not work in the 2014 tip over? How many wheel sections are in Pivot 1 and Pivot 2? What is the circumference of the pivot circles? What is the combined total mileage length of the different pivot tracks?**

Do the pivots/ wheel systems cross waterways? By what means? A pivot system cannot be shielded in such manner that pollutants aren't

carried and dropped into waterways from the body parts/hardware of the pivot equipment while passing over it. The entire functional reality in this context must be evaluated. What is the lag time between signal and full shut off (no residual drip)? Is each section of the pivot system pressure regulated? What is the lag time from shutoff signal to pressure to zero on the outgoing flow?

In trials ran on VRI equipment (ASABE Technical Library) a catch can test on a SS-VRI equipped pivot system resulted in evaporation and drift loss at an average of 9.3% and ranged from 1% to19 % the question again is: Given that data how can zero discharge be assured?

Page 54 mentions a " 4 inch underground pipe to a number of hydrants" for caring suspended solids to the paddocks. 4 inches under the ground-ground now disturbed/loosened by the burial of pipe and, heavy weight pivot wheel systems crossing these pipes. Can that pipe withstand the weight load of a pivot system wheel section? Is this gun section limited to the 82 acres M and S area only or all areas "outside the liquid effluent application' (page 54 new proposal). What paddocks by number are involved in this concept?

At this point of time, (4Feb 2014) measured levels of pollution have been determined at multiple levels above a safe number and these polluted waters running into the ocean affect the "protect conditions" exactly as described above. **The reason for the disregard/disconnect from regulatory statues listed above and the certain continued pollution must be explained in reality based parameters. In that context HDF must explained, beyond the usual generalities, how they intend to meet non pollution requirements.**

There are multiple general explanations intermingled with varied specifications of acreage that will be used for grazing/paddock . **With all setbacks considered- raceways, milk parlor silo, storage. graveyard etc. What is the specific total number of acres that a dairy cow will**

generally occupy for grazing purposes only? Please detail those pods and acre amounts?.

With the average mortality rate given dairy cows what data justifies and supports the small ("about 4400 sq. feet") only set aside (see page 101)? Two thousand dairy cows and a tenth of acre "Animal Cemetery " is not a sensible projection. The average mortality rate of dairy cows at this time is in the 5% yearly range. "The new and higher rate may be due to regulatory change in the United States. when at end of December 2003 new regulations required euthanasia of downer cows to prohibit use in human food supply channels(USDA, 2003). "That change would be expected to shift DHI reporting of reason for lactation termination from "sold for slaughter or salvage" (formerly "sold for beef")to "died" (Animal Improvement Programs Laboratory,2007), as noted by Fetrow et al. (2006"). On page12 and 13 Table 5 One category displays "Depth to Water table" **That soil category of the Animal Cemetery is shown as greater than 80 inches .On page 97 HDF indicates "Pits will never go deeper than 8 ft (96 inches) This is but one example of disjointed, multiple and serious conflicts in their own data. For all they know that's at a water level or close. What burial depth can one assume will be used.?**
At full build out of a 2000 dairy cow, the annual 5% mortality rate would mean approximately 100 burials a year in a space no bigger than most single family building lots **.What explains this discrepancy in space requirement needs ? In addition, the placement of the HDF "Animal Cemetery" is near a stream, and in situated in an area where mountainside rain runoff is peak. None of this placement makes sense and it must. What should be considered as an appropriate site and size if the Animal Cemetery carcass disposal is as** planned**? Given storm water infiltration: at the level of burial depth when does leaching of the decomposing carcasses occur and percolate to the ground water begin? Do the math: 2 ft wide- 5 ft minimum length -3 ft separation of burial site. Where and when does HDF start the next site? Was any conversations held with any slaughterhouse owners re: disposal of the dairy cows? Was conversations re: this matter- held with slaughterhouse owner Willie Sanchez? What are HDF slaughter house needs? For what purpose will HDF use a slaughter house?**

In seismic planning for retrofitting or design of new buildings the terms "worst case scenario" or" significant events" are primary to setting the parameters to be met. From Waste management through Nutrient plans HDF's presentation appears to misunderstand that basic expectation .HDF language speaks in terms of "average" There is nothing precise in that term. Words like "assume" have no place, nor is a sensitive factor presented as "observed. " Average" is not "actual" nor does it bear the weight of requirements that must be based on actual measurements. Average has a wide bandwidth, not one singular condition only. You do not develop plans for developments, such as an experimental dairy project, based on average, generalizations, or probability, but build on "possibility of" and specifics. If anyone is to find legitimate support for this project, conclusory assertions must be replaced by data and that data being interpreted correctly. At this time the deficits in HDF's presentation are obvious and if left to stand unacceptable .**What should/can be done to gain the validity and precision required for this proposal?**

The well system serving Koloa and Poipu is not as depicted (Quote Page 12" HDF proposal) "**The Koloa F well is located1/2 mile away.**" The purpose of that HDF statement denies reasonable explanation and frankly is suspect. Well F and other public wells in the same area are within 350-750 feet. There is a host of questions: **How and why can such mistake in measurement be committed? Were any water officials consulted? When? With whom, and for what reason? Did HDF know that the County wells provided water for all of Poipu and most of Koloa? What EIS reviewers will be involved in reviewing this area? The same footprint over the aquifer where the well are sited is shared by the 82 acre Manure and Sludge area of HDF. Were the county officials made aware that abutting the actual well system was 82 acres of drip system irrigated manure and sludge (M and S) not only next to but on top of the ground water aquifer feeding those wells?** The questions now listed concerning this matter are but few of those in this specific area that require scrutiny and factual explanation. **Why in particular was "1/2 mile" used as an indicated offset distance figure from the wells, and not the true figure?**

On page 54 3rd proposal- one reads "gun type application system to area outside the liquid effluent application" Those areas are on the fringe areas of the property .On page 54 Redacted and 3rd proposal they reference" the gun and their 65 foot radius of spray area will be moved around the paddocks" The first gun type is of mounted end guns on the pivot ends. The second gun system is hydrant mounted guns used in the paddocks. Some paddocks; almost the closest property to Mauhaulpu Rd will be covered by the first method. Use of the hydrant mounted gun system in other paddocks sets aside all the assurances and claimed precision of the VRI system of irrigation. It is a known wrong and primitive solution never to be used to spray potential pollutants in sensitive areas. It literally cuts corners (see 442-page 8 FOTG "Irregularly shaped pen areas that are impractical to treat with a sprinkler system") **How many of the paddocks are irregularly shaped**? Gun sprinklers should not be allowed. It is a rare reader that has not been hit by windblown sprinkler spray of gun type. At the Mahaulepu site are multiple water ways within a sprinkler span. For example (See page 32 (canal/ditch) running through the lower right corner of the property and which they will irrigate by pivot end gun use. A gun type irrigation system spraying effluent will with wind drift create a combination of pollution either by odor, mist or both. Its error rate is high, it precision and sprinkler uniformity low. The sweep is outward, frequently random and its scatter at the whim of the wind. With sensitive stream areas nearby no error variable should be in play**. Given the multiple streams proximity and irrigation systems What data exists that would support this method as a reasonable irrigation method for either irrigation application concept HDF intends to uses? Why?**

HDF <u>must</u> demonstrate how they will comply not just they will comply to irrigation standards. Under NRCS FOTG Sec. 4 page 6 through 9 they must specifically relate each of the requirements to their field irrigation concept, and to the hardware used for such irrigation. HDF must demonstrate an understanding of and compliance to <u>all</u> regulations governing dairy operations. That compliance must be written, and open for EIS review.

The HDF impending purchase of Clover Leaf Dairy on the Big Island, should be considered under "cumulatively has a considerable effect" language or "commitment for larger actions" criteria 8 of the ESI Significant Criteria .Will this matter be reviewed? This purchase is HDF's second effort toward an announced 10000 dairy cow constellation .That figure points to a additional 10000 calving number every 14 to 16 months and higher each lactation period. Quotes by the present owner-Ed Boteilho raise serious concern .The following quote is part of an article " Dairy farming in Paradise *Dairying Across America: Hawaii"*

"Our land runs right down to the Pacific Ocean," said Ed Boteilo the farm's operator. "On a clear day, you can see some of the other islands. During the winter we often see whales swimming by." (2 full color photos were included with captions)
The admission ("Our land runs right down to the Pacific Ocean,") underpins the worst ecological/ environmental disaster New Zealand has faced in modern history.
The picture as captioned in the article is of itself revealing (,A single dairy cow grazing as a giant cruise liner passes by. However, what it reveals is not to many a magnificent, bucolic scene depicting the grandeur of spectacular agricultural setting. It could as well illustrate the greatest ecological/environmental disaster yet experienced in New Zealand and certainly all over England, France and the America's to name but a few of those area devastated by a lack of environmental concern. It could represent the single rule we are learning much to slow. "Large consolidations of cattle enclosed in confined spaces next to or over water bodies can create serious and lasting pollution."
Under the "prevent language" of 344-1, In what manner does one alert/involve government agencies regarding this pollution possibility? Does DOH have stream pollution readings of the Kahalo Ditch or at the ocean as the stream run off leaves the Clover Leaf Dairy? All major dairy pollution started with a small amount of dairy cows. Hawaii must take in advisement the yet unstudied environmental impact of this collective HDF effort**. What regulations cover the cumulative pollution possibility of this next step toward an intended 10000 dairy cow build up? 10000 dairy cows mean within 14 -16 months 10000 calves. Then what?**
If this uncontrolled concept can ruin New Zealand(an island) as it

has, the Big Island area size pales in comparison.

Prior to HDFs last proposal submittal a "**NRCS Customs Soil Resource Report for Island of Kauai Hawaii"** was published. Interestingly it covers and is limited to the Mahaulepu HDF property site. It points out clearly what HDF should have noted and considered in the last submitted proposal. It has been indicated by NRCS that the reason for that research report at that time and requesting agency are secret and protected, yet no search of the series 401 regulations have been found that impose such secrecy/privacy protocol.
General Manual
Part 450 - Technology
See401.A.1(450-GM, Amend. 9, March 2000)Part 401 - Technical Guides
Subpart A - **Policy and Responsibilities**
Who requested the above referenced specific NRCS Customs Soil Resource Report for Island of Kauai? When? When was it given to the requesting party?

If HDF was aware of this data, an intentional disregard for the data contained in the NRCS Customs Soil Resource Report for Island of Kauai Hawaii has occurred. That significant "error of omission" requires open explanation. Will the EIS process evaluate this concern? If HDF was the requesting party then ignoring its content creates a serious breach in protocol governing multiple governmental agencies. The afore mentioned report is an objective analysis. It points out with critical science based data why HDF is not a project suited to this particular site. Did HDF have knowledge of the existence of the NRCS Customs Soil Resource Report for Island of Kauai? If not –Why not? Has effort been made by HDF to now integrate or respond to the data in this report? What efforts by detail have been made?
No expert, shown this report by the writer, including one former farm loan bank officer, have found it as supporting- in any way- this concept- at this site. On the contrary the report is a stand alone analysis of which no one could deny its data or impact. One reviewer with shaking head ask 'what is their real intent for the use of this land? **Is the financial backing source-Pierre Omidyar- or Kyle Datta aware of the findings contained in this report? Is Pierre Omidyar aware of the EIS review or this report? Why was its clear, concise findings ignored? Why even now is it ignored,**

not acknowledged or considered by HDF in formal presentations? What data based facts can outweigh the burden of evidence contained in the NRCS Customs Soil Resource Report for Island of Kauai? Will the EIS take in consideration the full import of this report? In what manner and by which of the review agencies will it be considered?

In the area of professional preparation: has Group 70 ever developed or evaluated a Waste Management Plan of a dairy similar to the one proposed by HDF? When? Where? What other dairies have they designed waste management plans for?

In closing: Proposals made to approving entities are to explain not to confuse. They should alleviate fear or tensions, assure that no damage or harm exists in what is proposed. Some include a clear validation of its need or necessity. This expectation was not meet by the one now being considered.

Those of us voicing concerns are for reasonably sized and sited dairies. None of us believe Mahualepu is a legitimate choice. As there exists a difference between legal and ethical, there too is a difference between could and should.

Pierre Omidyar, Ulepono Initiative, and Hawaii Dairy Farms **should** do the right thing.

GROUP 70
INTERNATIONAL

May 26, 2016

Ronald O. John
Rorajohn@aol.com

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Ronald O. John:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

GROUP 70 OBJECTIVITY: Group 70 International, Inc. (Group 70) is responsible for the preparation and processing of the Hawai'i Dairy Farms Environmental Impact Statement (EIS). The EIS was prepared in accordance with the requirements of Chapter 343 Hawai'i Revised Statutes and the "Environmental Impact Statement Rules" (Chapter 200 of Title 11, Hawai'i Administrative Rules). The environmental planning team at Group 70 has prepared several hundred Environmental Assessment and EIS documents over the past 40 years, and every document has been accepted by the responsible County, State and Federal agency. On numerous past EIS projects, the Hawai'i Chapter of the American Planning Association has recognized Group 70's professional work with Chapter awards for excellence in environmental planning. Part of the EIS scoping process involves Group 70's experienced team of technical sub consultants that are well-known and qualified in their respective fields of study. For this project, Group 70 is preparing the Hawai'i

Dairy Farms EIS with the level of analysis required to properly evaluate and disclose the existing environmental conditions, probable impacts with mitigation, and potential cumulative and secondary effects.

SOILS: Soil is an ecosystem that can be managed to provide nutrients for plant growth, to absorb and hold rainwater for use during dryer periods, to filter and buffer potential pollutants from leaving fields, to serve as a firm foundation for agricultural activities, and to provide habitat for soil microbes to flourish and diversify to keep the ecosystem healthy. Two rounds of independent soil sampling were undertaken at HDF to understand and characterize available soil nutrients and conditions. Section 4.3 of the Environmental Impact Statement (EIS) characterizes soil conditions, and anticipated impacts from effluent and supplemental nutrient application. Recommendations from Dr. Russell Yost and Nicholas Krueger of the University of Hawai'i at Mānoa are summarized. Their baseline nutrient report is included as Appendix C of the Draft EIS.

Soil conservation is a core principal behind establishment of the NRCS, which was formed out of the Soil Conservation Service to acknowledge its expanded role in watershed-scale approach using science-based tools and standards in agronomy, engineering economics, wildlife biology and other disciplines to aid landowners in implementation of conservation practices. NRCS conservation practices are listed in Chapter 3, Section 3.2; these practices codes identify design and construction standards related to drainage, materials, operations and applicable engineering standards. HDF will follow the developed Conservation Plan, which was approved by the West Kaua'i Soil & Water Conservation District in December, 2013.

The United States Department of Agriculture (USDA) Natural Resources Conservation Services (NRCS) has mapped and classified soils for more than 95 percent of the United States. Comments received during the initial scoping for this EIS included a "Custom Soils Resource Report for Island of Kaua'i, Hawai'i." The report was generated from the USDA NRCS website, which allows any internet user to define an area of interest, customize data results, and generate a Custom Soil Resource Report. The user can select or deselect parameters based upon which data the user would like to display. These user-generated reports are not evaluated by NRCS.

The NRCS soils classifications and descriptions provide a good information base, however, in-field soils testing is needed to identify existing soil nutrient levels and conditions. The most abundant soil types at the HDF site are Kalihi Clay at 32 percent, Ka'ena Clay Brown Variant at 29 percent, and Lualualei Clay at roughly 14 percent of the dairy site. Laboratory analysis of soil samples collected in 2014 identified levels of pH, phosphorus, nitrogen, potassium, calcium, magnesium, organic matter, salinity, micronutrients and other constituents. The results illustrate that the soils are depleted of nutrients, which is typical for lands formerly used for sugarcane. The soil nutrient status and fertility demands of the primary crop, Kikuyu grass, were used to identify the quantities of nutrients required for productive grass growth. The soils data provide a baseline to guide adaptive nutrient management throughout establishment and maturity of the dairy.

A second round of field sampling was conducted in 2015, and focused on evaluation of soils characterized as "poorly drained", and established a quantitative baseline of soil salinity and sodicity to provide for future monitoring of soil health with application of manure effluent. Laboratory analysis determined electrical conductivity and exchangeable sodium percentage, in addition to nutrient levels of nitrogen phosphorus calcium, magnesium, and potassium.

Poorly drained is not an indication of low or poor infiltration. Infiltration refers to the ability of water to enter the soil surface, whereas "drainage" refers to the movement of water within or from the soil profile. Poorly drained soils typically have low hydraulic conductivity, or a slow rate of groundwater movement through the soil. This slow movement can create anaerobic conditions, which typically result in higher rates of denitrification. This is the conversion of potentially nitrates and nitrites to gaseous forms, which reduces the potential for impacts on waterbodies. In this way, "poorly drained" soils may represent less risk of nitrate and nitrite leaching to associated waterbodies than "well drained" soils (Yost, 2016).

As a result of reduced movement of water through the soil profile, the mobility of nutrients such as potassium and phosphorus is also reduced. Soil types at the HDF site are known to adsorb and retain large amounts of phosphorus. Under the NRCS phosphorus leaching index for Hawai'i soils, HDF soils show low risk for leaching. With low risk, phosphorus can be applied at rates greater than crop requirements if manure or other organic materials are used to supply nutrients.

The dairy's focus on robust and healthy grass growth will build organic matter in soils through use of manure as a natural fertilizer. Soil can incorporate carbon from the atmosphere, which benefits soil health. According to recent studies in the Soil Science Society of America Journal, the conversion of formerly tilled cropland to grazed pasture can drive substantial accumulation of organic carbons in soil, with a potential to offset up to one-third of the annual increase in atmospheric carbon dioxide. The potential soil organic matter and carbon dioxide sequestration benefits are likely greatest in highly degraded soils in warm subtropical climates, partly due to long pasture-growing seasons. Long-term soil impacts are anticipated to result in improvement to the physical, chemical, and biological condition of the soil.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite,

a soft, thoroughly decomposed rock. The Māhāʻulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhāʻulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Poʻipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhāʻulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawaiʻi Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhāʻulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhāʻulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhāʻulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kauaʻi community.

Regional Water Demand: The adjacent, developed Kōloa-Poʻipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kauaʻi will increase county-wide by 17,300 residents by 2030. The South Kauaʻi population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kauaʻi region (the Kōloa - Poʻipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhāʻulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhāʻulepū watershed.

The HDF site is located on the bottom-land of the upper Māhāʻulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Haʻupu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhāʻulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction

Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kaua'i Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhā'ulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhā'ulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhā'ulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways;

only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhā'ulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Po'ipū region were also calculated. Nitrogen input to the marine environment in the Po'ipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Po'ipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal

area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kaua'i community.

NATURAL HAZARDS: The potential impacts of natural hazards are evaluated in the Draft Environmental Impact Statement (EIS), including flooding, tsunami, earthquakes, and hurricanes. Draft EIS Section 4.6 addresses natural hazards.

The Māhā'ulepū property is not known to experience flooding conditions. The area is located within Federal Emergency Management Agency (FEMA) Zone X, areas determined to be outside the 0.2% annual chance floodplain. The proposed location for Hawai'i Dairy Farms (HDF) lies between the 60 and 150 feet elevation, outside the tsunami evacuation zone. The Kaua'i and Ni'ihau region of the Hawaiian Islands has experienced tremors from earthquakes originating further south in the island chain, but no known seismic activity has originated among these northern islands.

Although they occur infrequently, Kaua'i has received a greater amount of damage from hurricanes when compared to the other Hawaiian Islands. Land management personnel in the Māhā'ulepū region during and following the hurricanes that affected Kaua'i in 1982 and 1992 observed defoliation of vegetation, and no flooding events in the period following passage of the storms.

Preparedness is the best protection for natural disasters. Structural design of dairy facilities will meet International Building Code (IBC) 2006 standards with local amendments. Provisions in design will address wind loading (including hurricane gusts), rain and flood loading, and earthquake loading. A geotechnical evaluation of the area recommended Seismic Site Class D under IBC standards be utilized for foundation design where the barns and agricultural infrastructure will be constructed.

There has been no rainfall event that would exceed the capacity of the effluent ponds since rainfall has been recorded in Māhā'ulepū Valley. The effluent pond capacity has been designed above the regulatory requirement to contain the 25-year, 24-hour rainfall event. An emergency containment berm with additional capacity for another 30 days is included in the design. This design exceeds regulatory requirements, with containment in excess of the major rainfall events recorded on Kaua'i over the past three decades.

An emergency preparedness plan for protection of animals has been prepared for HDF internal use that addresses hurricane, fire, and potential flooding hazard scenarios. HDF is not in a tsunami inundation area, so this scenario is not planned for in the disaster plan. The disaster plan relies upon knowledge of cow behavior, and is based on extensive guidance for livestock protection from NRCS, the Florida State Agricultural Response Team (SART), Pennsylvania State College of Agricultural Sciences, and Cornell University Cooperative Extension. The plan includes safety procedures during any disaster, follow up actions, and emergency contacts for assistance before, during or following the event. Further information is provided in the Draft EIS Section 4.6.2.

AIR QUALITY: As a part of the Environmental Impact Statement (EIS), existing air quality conditions and project impacts were evaluated, including dust and odor. Potential odors and emission levels for air pollutants relevant to dairy operations were modeled, as currently there are no cows on site. EIS sections 4.19 and 4.25 provide an evaluation of air quality and odors, including a windrose depicting wind speed and direction in the area (see DEIS Section 4.1, Climate). The full air quality technical report can be found in Draft EIS Appendix I.

Clean Air Act

Under the *Clean Air Act of 1970* (CAA), amended November 1990, the U.S. Environmental Protection Agency (EPA) regulates both large and small sources of air pollutants by establishing National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. The State of Hawai'i has established its own *State Ambient Air Quality Standards* (SAAQS) that are as strict or, in some cases more strict than the NAAQS. State standards prohibit any visible emissions of fugitive dust from construction activities at the property line.

Emissions relevant to livestock operation include particulate matter and fugitive dust. Greenhouse gases related to dairy cows include methane (CH_4) from enteric fermentation, and both methane and nitrous oxide (N_20) emissions from manure application. No State or Federal regulations for greenhouse gas emissions from farm operations or small businesses currently exist.

ODOR

Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF, so air dispersion models were used to determine potential odor levels. Local weather data was used in conjunction with the AERMOD modeling

system, and published rates for manure odors emissions for dairy heifers and effluent ponds were adapted to reflect the HDF facilities.

Odor emission sources identified for modeling at HDF were manure in the pasture fields, irrigation water containing diluted nutrients from effluent, the effluent storage ponds, and the dairy buildings. Odor rates from published research were applied. Odor isopleths (a line used to map all points having the same numerical value) were created to display the model findings. Odor is described in "odor units" at the threshold of perception, which is defined by the point at which 50 percent of panelists, in laboratory conditions, cannot smell the odor but 50 percent of the panelists can detect the odor.

Modeling results were generated for worst case meteorological conditions (low wind velocity / mixing). Generally, tradewinds will disperse odors to less than detectable levels beyond the HDF site; in periods of no wind, odor may not be dispersed creating the "worst case" scenario. In these periods without normal tradewind flow, the odor plume would extend to the south of the HDF site. Sections 4.19.2 and 4.25.2 of the EIS include graphics of the potential odor isopleths.

Results for the committed herd size of 699 mature dairy cows show that odors may be detectable by 50 percent of the sensitive population once per 200 hours, or 44 hours per year, within an area that extends approximately 1,670-feet (within one-third of a mile) beyond the dairy farm boundary, and does not reach recreational or residential areas. Results for the contemplated expanded herd size of up to 2,000 mature dairy cows show odors would not extend beyond 2,780 feet outside the HDF boundary (just over half a mile), again not reaching recreational or residential areas, and again with detection limited to 50 percent of the sensitive population approximately 44 hours per year. The parameters used in the analysis were intentionally conservative, and the impacts shown assume an unlikely confluence of worst-case meteorological data, irrigation location, and grazing location. Actual offsite odor impacts are likely to be much lower and/or less frequent than shown; it is likely odor detection beyond the HDF boundaries will be less frequent.

DAIRY OPERATIONS: Hawai'i Dairy Farms (HDF) will establish and operate a sustainable, pastoral rotational-grazing dairy farm in Māhā'ulepū Valley on the island of Kaua'i to produce fresh, locally available nutritious milk for Hawai'i families. The rotational-grazing method utilizes 100 percent of the cows' manure as natural fertilizer to grow pasture grass as a primary source of nutrition for dairy cows. This cost-effective method will reduce reliance on imported fertilizer and feed. Pasture grass will comprise at least 70 percent of the animals' diet. As a part of the Draft Environmental Impact Statement (EIS), the proposed facilities and operations for the dairy farm are described in Chapter 3.

The Environmental Impact Statement (EIS) Preparation Notice (EISPN), published January 23, 2015, described the proposed pasture-based rotational grazing system as a "zero-discharge, grass-fed dairy". The term "zero-discharge" under the U.S. Environmental Protection Agency related to concentrated feeding operations (CAFO) is a system designed to not discharge pollutants into waters of the United States. As noted previously, the HDF system is designed to utilize 100 percent of the

cows' manure on-site. However, nutrients would be introduced to the HDF site with any use; the Draft EIS identifies the amount of nutrients anticipated from the proposed dairy operations that could pass through to ground and surface waters. Therefore, HDF elected to discontinue use of the term "zero discharge" as it was construed as no nutrients into the system.

The term "grass-fed" was used in the HDF EISPN. This term was used to identify HDF's intent to utilize a locally-produced feedstock – grass – for more than 70 percent of the dairy herds' diet. In January 2016, the U.S. Department of Agricultural (USDA) Marketing Survey created a narrow legal definition of "grass-fed". The USDA standard defines what animals can and cannot be fed. The Food Alliance, a project of several northwest colleges, believes that when consumers choose grass-fed products there is an expectation that these will come from animals raised on pasture on a forage-based diet. Due to the evolving definition of "grass-fed", the term in not used in this EIS.

The dairy facilities will occupy an area of approximately 10 acres on the western boundary of the site. The developed area "footprint" will be less than 2 percent of the total farm area. Four buildings will be constructed to serve different functions, supported by utilities and infrastructure. Additional building information can be found in Draft EIS Section 3.3.1.

Agricultural infrastructure and utilities required for the dairy operations will include storage tanks and silos, effluent storage ponds, livestock water systems, and drainage improvements. The irrigation system and distribution of livestock water are discussed in Draft EIS Section 3.5, Pasture Management.

The pastoral rotational-grazing dairy provides a local feedstock – grass – as the herd's primary food source. Reducing imported feed stabilizes costs and provides a food source closer to the natural diet of cows. Results of grass trials initially conducted at five sites across four Hawaiian Islands were instrumental in identifying appropriate varieties of grass, and suitable sites to support sufficient "dry matter" grass yields essential to a cow's diet. Additional project-specific trials at the Māhā'ulepū site on Kauai have been conducted for more than 18 months. The results have identified sufficient yield and nutrition to supply 70 percent of the cows' diet; improvements in grass productivity are anticipated to provide up to 85 percent of cows' diet.

The pasture-based model allows cows to move about freely, and to lie down and rest, which is part of the digestion cycle. The animals are managed in social groups known as "mobs", mimicking the natural social order of bovines. Cows spend 22 hours of each 24-hour period foraging on pasture or resting, outdoors in natural light and fresh air. The gently sloped paddocks, walkways and races minimize the energy expended by the mature dairy cows as they graze or are transferred to and from the various paddocks and the mature dairy facility; surfaces of the walkways and cow races are designed to provide a comfortable path under hoof. The management practices and pasture model applied by HDF maximizes grass as the cows' primary nutrition source and minimizes stress to the animals. Cows tend to be

healthier and live longer, productive lives with access to fresh air, high quality feed, and exercise while they forage.

The 470 acres of pasture will be divided into paddocks averaging 3 to 5 acres in size. Smaller paddocks located near the dairy facility will be used as temporary pasture for cows or calves being moved on or off the farm. To protect the water quality of surface water and downstream areas, paddock fences are set back 35 feet from the edge of drainage ways throughout the site. Existing vegetation within the setbacks will be managed or restored to reduce erosion, improve stability of ditch banks, increase net carbon storage, and improve and maintain water quality.

The majority of the pastures will be irrigated with non-potable water and/or diluted effluent through either the pivot irrigation systems or through gun irrigators. Irrigation water supply is provided to the farm from Waita Reservoir, and will be filtered and pumped to the various irrigation components on the farm. The irrigation system is controlled using computer software and GPS receivers to allow very precise application of irrigation and/or diluted effluent on the pasture. The pivots can rotate and apply irrigation water and/or diluted effluent at different rates depending on the actual irrigation needs of the farm.

NRCS provides technical guidance on applying agricultural waste depending on the desired use of the waste. Reflected in the title of the livestock waste guidance for Hawai'i is the parenthetical inclusion of the word "nutrients." Where waste is utilized as a resource, it is being used for the constituent components that provide benefit.

The NRCS Conservation Practice Standard 590, Nutrient Management, applies to commercial fertilizers, organic by-products, waste water, organic matter, and irrigation water. Nutrient management is the practice of managing the amount, rate, source, method of application, and timing of plant nutrients and soil amendments. The timing and application of nutrients will correspond with plant uptake, soil properties and weather conditions. For more information on nutrient balance management see Draft EIS Section 3.5.3, and Draft EIS Appendix D.

The effluent storage ponds are sized to accommodate 30 days of storage for up to 2,000 mature dairy cows, and over 85 days of storage for 699 mature dairy cows. It will be highly unlikely that the storage pond will be full at any time for the contemplated 2,000-cow dairy, and nearly impossible for the committed 699-cow dairy. Throughout the less than 30-day storage period, effluent is planned for application every four days, and the slurry application is expected at least once every 45 days, to ensure that the ponds are kept at manageable levels.

Cows lactate milk following the birth of calves. Newborn calves will be housed on the Māhā'ulepū site and provided essential colostrum and nutrients for a healthy start. During the calves' initial 90 days, they will be transitioned to pasture at HDF before transfer to ranches on Kaua'i to be raised off-site. The committed herd size of 699 mature dairy cows at the Māhā'ulepū site applies to mature mature dairy cows. Animals in various stages of lactation and rest will be transferred between HDF and other partner ranches as needed for animal health and dairy productivity. This will

benefit both the dairy and infuse the beef market in Hawai'i with a new, local source of pasture-raised calves. Male calves will become part of the beef cattle herd; heifers (young female calves that haven't given birth) will be raised until ready to return to the HDF herd as a birthing/mature dairy cow. For more information on off-site herd management, refer to Section 3.7 of the Draft EIS.

Health of the herd is of primary importance as the success of a dairy relies on cows effectively producing quality milk. All cows will be treated with a high standard of care. Dairy managers and caretakers will be trained and competent in handling animals to minimize stress and ensure the herds' welfare. A licensed veterinarian may prescribe use of antibiotics approved by the Food & Drug Administration (FDA) for treatment of illnesses. Adherence to guidelines that prohibit milk from cows undergoing antibiotic treatment will ensure no adulteration of milk. Routine laboratory tests of milk for traces of antibiotic residue will be conducted. HDF will not inject cows with bovine growth hormone, referred to as rBST or rBGH.

SOILS: Soil is an ecosystem that can be managed to provide nutrients for plant growth, to absorb and hold rainwater for use during dryer periods, to filter and buffer potential pollutants from leaving fields, to serve as a firm foundation for agricultural activities, and to provide habitat for soil microbes to flourish and diversify to keep the ecosystem healthy. Two rounds of independent soil sampling were undertaken at HDF to understand and characterize available soil nutrients and conditions. Section 4.3 of the Environmental Impact Statement (EIS) characterizes soil conditions, and anticipated impacts from effluent and supplemental nutrient application. Recommendations from Dr. Russell Yost and Nicholas Krueger of the University of Hawai'i at Mānoa are summarized. Their baseline nutrient report is included as Appendix C of the Draft EIS.

Soil conservation is a core principal behind establishment of the NRCS, which was formed out of the Soil Conservation Service to acknowledge its expanded role in watershed-scale approach using science-based tools and standards in agronomy, engineering economics, wildlife biology and other disciplines to aid landowners in implementation of conservation practices. NRCS conservation practices are listed in Chapter 3, Section 3.2; these practices codes identify design and construction standards related to drainage, materials, operations and applicable engineering standards. HDF will follow the developed Conservation Plan, which was approved by the West Kaua'i Soil & Water Conservation District in December, 2013.

The United States Department of Agriculture (USDA) Natural Resources Conservation Services (NRCS) has mapped and classified soils for more than 95 percent of the United States. Comments received during the initial scoping for this EIS included a "Custom Soils Resource Report for Island of Kaua'i, Hawai'i." The report was generated from the USDA NRCS website, which allows any internet user to define an area of interest, customize data results, and generate a Custom Soil Resource Report. The user can select or deselect parameters based upon which data the user would like to display. These user-generated reports are not evaluated by NRCS.

The NRCS soils classifications and descriptions provide a good information base, however, in-field soils testing is needed to identify existing soil nutrient levels and conditions. The most abundant soil types at the HDF site are Kalihi Clay at 32 percent, Ka'ena Clay Brown Variant at 29 percent, and Lualualei Clay at roughly 14 percent of the dairy site. Laboratory analysis of soil samples collected in 2014 identified levels of pH, phosphorus, nitrogen, potassium, calcium, magnesium, organic matter, salinity, micronutrients and other constituents. The results illustrate that the soils are depleted of nutrients, which is typical for lands formerly used for sugarcane. The soil nutrient status and fertility demands of the primary crop, Kikuyu grass, were used to identify the quantities of nutrients required for productive grass growth. The soils data provide a baseline to guide adaptive nutrient management throughout establishment and maturity of the dairy.

A second round of field sampling was conducted in 2015, and focused on evaluation of soils characterized as "poorly drained", and established a quantitative baseline of soil salinity and sodicity to provide for future monitoring of soil health with application of manure effluent. Laboratory analysis determined electrical conductivity and exchangeable sodium percentage, in addition to nutrient levels of nitrogen phosphorus calcium, magnesium, and potassium.

Poorly drained is not an indication of low or poor infiltration. Infiltration refers to the ability of water to enter the soil surface, whereas "drainage" refers to the movement of water within or from the soil profile. Poorly drained soils typically have low hydraulic conductivity, or a slow rate of groundwater movement through the soil. This slow movement can create anaerobic conditions, which typically result in higher rates of denitrification. This is the conversion of potentially nitrates and nitrites to gaseous forms, which reduces the potential for impacts on waterbodies. In this way, "poorly drained" soils may represent less risk of nitrate and nitrite leaching to associated waterbodies than "well drained" soils (Yost, 2016).

As a result of reduced movement of water through the soil profile, the mobility of nutrients such as potassium and phosphorus is also reduced. Soil types at the HDF site are known to adsorb and retain large amounts of phosphorus. Under the NRCS phosphorus leaching index for Hawai'i soils, HDF soils show low risk for leaching. With low risk, phosphorus can be applied at rates greater than crop requirements if manure or other organic materials are used to supply nutrients.

The dairy's focus on robust and healthy grass growth will build organic matter in soils through use of manure as a natural fertilizer. Soil can incorporate carbon from the atmosphere, which benefits soil health. According to recent studies in the Soil Science Society of America Journal, the conversion of formerly tilled cropland to grazed pasture can drive substantial accumulation of organic carbons in soil, with a potential to offset up to one-third of the annual increase in atmospheric carbon dioxide. The potential soil organic matter and carbon dioxide sequestration benefits are likely greatest in highly degraded soils in warm subtropical climates, partly due to long pasture-growing seasons. Long-term soil impacts are anticipated to result in improvement to the physical, chemical, and biological condition of the soil.

DEMOGRAPHIC AND ECONOMIC: The potential impacts of Hawai'i Dairy Farms (HDF) to the existing economy were evaluated in the Draft Environmental Impact Statement (EIS), including a fiscal impact assessment report completed in April, 2016 by Plasch Economics Pacific. Draft EIS Section 4.15 addresses demographic and economic factors, with the complete report in Appendix J.

The HDF project would create short-term benefits through jobs for local construction personnel and local material suppliers. Such jobs would include equipment operators, cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, supervisors, painters, etc. Based on State employment multipliers, indirect employment related to Dairy construction would be expected to average about 16 jobs on Kaua'i, and 8 on O'ahu. Construction employment would be expected to average about 12 jobs per year during the development period. Thus direct-plus-indirect employment association with construction would be expected to average approximately 36 jobs, of which 28 would be on Kaua'i.

The HDF project would contribute to diversification of Kaua'i's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Hawai'i Island), approximately10 percent of Hawai'i's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and indirect full-time equivalent jobs on Kaua'i, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on O'ahu.

HDF is expected to generate a net income of approximately $68,000 to the County when the 699 cow herd is established. When the dairy has matured to full production for the 699 cow dairy, net income to the State is calculated at $160,000 annually. With the potential contemplated herd size of up to 2,000 mature dairy cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be produced. This would double local milk production currently supplied by operational dairies on the Island of Hawai'i.

Additional employment generated by a possible expansion to accommodate the contemplated 2,000 mature dairy cow herd is estimated at approximately 3 construction jobs plus 4 indirect jobs on Kaua'i, and 2 indirect jobs on O'ahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an additional 5 full-time farm jobs would be added, with approximately 15 additional indirect jobs on Kaua'i and another 8 indirect jobs on O'ahu.

The dairy is expected to generate a net additional contribution to the County of approximately $8,000 for improvements related to expansion for the contemplated herd size of up to 2,000 mature dairy cows ($76,000 total versus $68,000 for the committed herd size). The State will derive approximately $360,000 annually in revenues from the contemplated 2,000-mature dairy cow dairy.

Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

FLORA AND FAUNA: Botanical, avian, and mammalian surveys of the property were conducted for the Draft Environmental Impact Statement (EIS) to assess existing species on site, including identifying any species listed as endangered, threatened, or proposed under any state or federal endangered species programs in or near the property. EIS Sections 4.9 and 4.10 address the evaluation of flora and fauna resources, with technical studies in Appendix A and B.

A botanical survey of the dairy property was conducted in August 2014 by AECOS Consulting to assess existing plant species. The survey also investigated for the presence of plants currently listed as endangered, threatened or proposed for listing under Federal or the State of Hawai'i's endangered species programs, located onsite or within the immediate vicinity of the dairy site. The nature of the land and its present and historical uses for intensive agriculture very much limit the natural botanical resources anticipated to occur on this land. Complete species lists are included in the EIS, and no protected botanical species occur on the project property. The project will include vegetated buffer strips along the drainage ways as part of the Conservation Plan to reduce erosion and stabilize slopes. Where native plants occur or could survive if planted, native plants will be used in the stabilization. No long-term impacts to native plant habitats or endangered or threatened plants species will occur as a result of the dairy.

Avian and mammalian surveys were conducted in August 2014 by Rana Biological Consulting, Inc. This survey was conducted to assess the potential presence of avian or mammalian species currently listed as endangered, threatened or proposed for listing under either Federal or the State endangered species lists. The survey covered the dairy site area and immediate vicinity. Common birds and terrestrial mammals were encountered on the property. There is no critical habitat for endangered species in the upper Māhā'ulepū Valley.

Four species of endangered waterbirds were recorded on the site and at the nearby taro farm located within the HDF site. Though the area does not provide critical habitat, seabirds that nest in upland areas of Kauai may overfly the site. The endangered Hawaiian goose, nēnē was also seen on the site. State Division of Forestry and Wildlife biologists have noted nēnē are regularly seen on the subject property. It is probable that some nest on or adjacent to the site as this species nests in the general Kōloa area, and the habitat present on parts of the site is suitable for nēnē nesting.

The principal potential impacts posed to the five endangered species include those potentially associated with construction activities, and those associated with dairy farm operations following build-out. Measures will be adopted to avoid potential seabird and nēnē goose collisions with fences and structures. Potential measures

include lowering construction cranes at night, using conservation fencing to project-specified areas, marking tall structures and fencing with white visibility polytape, limiting nighttime lighting, and shading any outside lights used at night. Ongoing mitigation strategies will be implemented for day-to-day preventative measures, including an Avian Species Protection Plan. Mitigation measures are further described in DEIS Section 4.10.2.

It is also likely that Hawaiian hoary bats overfly the project area on a seasonal basis. While caution will be taken during any potential disturbance or vegetation removal, there are almost no suitable roost trees within the dairy site, thus it is expected that the dairy farm will not affect this listed mammalian species.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

Vince and Fran Jones
1565 Pee Road #116 ••• Koloa, HI 96756 ••• (808) 742-7874

February 22, 2015

Ms. Laura McIntyre
State of Hawai'i, Department of Health
1250 Punchbowl Street
Honolulu, HI 96813

Mr. Jeff Overton
Group 70 International, Inc.
925 Bethel Street (5th Floor)
Honolulu, HI 96813

Hawai'i Dairy Farms, LLC.
P. O. Box 1690,
Koloa, HI 96756-1690

Dear Madam or Sir:

I am responding for my wife and I to the Call for Inputs that will help to define the scope of the Environmental Impact Statement ("EIS") to be prepared during the coming months related to the proposed Hawai'i Dairy Farm ("HDF") in Maha'ulepu Valley, Kauai, Hawaii. We have the following concerns and hope they will be subjects of investigations during the EIS preparation:

1. We own a unit in the Poipu Sands condominium located in the Poipu Kai Resort situated just west of the Grand Hyatt Hotel and Resort. The trade winds generally come from the northeast which would bring any odors from the HDF through our property. As past Wyoming cattle ranchers we know of the odors that develop from a stationary herd of cattle. These smells are expected around ranches and other areas where cattle are confined, but are not expected in Hawai'i. If these odors transit from the proposed HDF it will impact not only our enjoyment of stays on Kauai but also income we obtain by transient rentals of our condominium unit. There is also the possibility (likelihood?) that the sounds of cattle mooing will be carried on the trade winds and heard through the day and night at the Hyatt and in the Poipu Kai Resort.

2. We have owned our condominium unit for 25 years and have enjoyed the Maha'ulepu Beach area during that period although we now hear that the waters in the area are unfortunately polluted, although investigations are underway to find out why and to try and recover the beach water quality. But this will possibly be impossible if cattle waste causes soil damage that permeates and/or transits to the south towards and to the Maha'ulepu Beach. This we believe should be avoided to preserve the environment in and around the Maha'ulepu Valley and beach area.

3. The two concerns above would, if negatively impacted by the HDF, cause a large financial loss to the County of Kauai. With the ease of transferring information through the public domain using today's internet system, it would soon become common

knowledge that the south shore of Kauai is no longer the place to vacation and/or live. This would create a large hardship for current property owners within a few miles of the HDF facility (and likely throughout the rest of the south shore resort area), and would certainly cause very large income reductions at the Grand Hyatt Hotel and Resort. All of these financial impacts would certainly change the current economic welfare of the community south of Kóloa, Kaua'i, Hawai'i … and a very significant reduction of County of Kaua'i property tax revenues and State of Hawai'i GET and TAT revenue collections.

4. Finally, we are unaware of an environmental restoration plan should the HDF be allowed to proceed with their plans which eventually do cause unacceptable damage even though the damage was not anticipated.

These are just a few of our concerns as long-term owners of south shore property, property whose financial value would likely be significantly damaged by HDF operation. If this occurs, the Kaua'i south shore area will certainly degrade and become drastically different than it is today.

Very truly yours,

Vince and Fran Jones

May 26, 2016

Vince and Fran Jones
1565 Pee Road #116
Koloa, HI 96756

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Vince and Fran Jones:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

SOILS: Soil is an ecosystem that can be managed to provide nutrients for plant growth, to absorb and hold rainwater for use during dryer periods, to filter and buffer potential pollutants from leaving fields, to serve as a firm foundation for agricultural activities, and to provide habitat for soil microbes to flourish and diversify to keep the ecosystem healthy. Two rounds of independent soil sampling were undertaken at HDF to understand and characterize available soil nutrients and conditions. Section 4.3 of the Environmental Impact Statement (EIS) characterizes soil conditions, and anticipated impacts from effluent and supplemental nutrient application. Recommendations from Dr. Russell Yost and Nicholas Krueger of the University of Hawai'i at Mānoa are summarized. Their baseline nutrient report is included as Appendix C of the Draft EIS.

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In this way, "poorly drained" soils may represent less risk of nitrate and nitrite leaching to associated waterbodies than "well drained" soils (Yost, 2016).

As a result of reduced movement of water through the soil profile, the mobility of nutrients such as potassium and phosphorus is also reduced. Soil types at the HDF site are known to adsorb and retain large amounts of phosphorus. Under the NRCS phosphorus leaching index for Hawai'i soils, HDF soils show low risk for leaching. With low risk, phosphorus can be applied at rates greater than crop requirements if manure or other organic materials are used to supply nutrients.

The dairy's focus on robust and healthy grass growth will build organic matter in soils through use of manure as a natural fertilizer. Soil can incorporate carbon from the atmosphere, which benefits soil health. According to recent studies in the Soil Science Society of America Journal, the conversion of formerly tilled cropland to grazed pasture can drive substantial accumulation of organic carbons in soil, with a potential to offset up to one-third of the annual increase in atmospheric carbon dioxide. The potential soil organic matter and carbon dioxide sequestration benefits are likely greatest in highly degraded soils in warm subtropical climates, partly due to long pasture-growing seasons. Long-term soil impacts are anticipated to result in improvement to the physical, chemical, and biological condition of the soil.

NOISE: Existing noise conditions of the project site and the surrounding Māhā'ulepū valley area are evaluated in the Draft Environmental Impact Statement (EIS), along with anticipated short-term and long-term noise conditions associated with the dairy farm and planned mitigation actions. Draft EIS Section 4.12 addresses noise conditions.

Noise can be defined as unwanted sound, a sound that is considered loud or unpleasant, and/or sound that causes disturbance. Research related to noise and livestock focuses on noise levels and minimization of unexpected sounds that cause undue stress on cows. Noise stress results in loss of livestock productivity and thereby financial loss to farmers and ranchers. Little research exists on the sound levels from livestock.

Sound is measured in decibels (dB). The State of Hawai'i Department of Health (DOH) rules use the A-weighting sound network (dBA) in the HAR §11-46, Community Noise Control. Sound through the air is similar to ripples on a pond of water. In open space without reflection, ripples spread uniformly in all directions and decrease in amplitude further from the source. In free field conditions such as outdoors, amplitude drops by half as distance doubles (OSHA, 2016). When sound passes close to absorbing ground cover such as grassland and fields, the "soft ground" absorbs extra sound as it passes. The Hawai'i Dairy Farms (HDF) site in Māhā'ulepū Valley is approximately 2 miles from the resort area, and 1.5 miles from the closest residential areas (on land zoned for agriculture). Typical noise currently generated near the HDF site includes truck ingress/egress along private farm roads, agricultural equipment, and cattle and sheep.

Construction work at the project site will involve activities that may generate an increase in noise levels. However, such exposures will be a short-term condition,

occurring during daylight hours. Construction vehicles and activities must comply with DOH Administrative Rules. DOH noise control regulation requires a permit for construction activities that emit noise in excess of 78 decibels or that cost a total of more than $250,000. Mitigation measures to minimize construction noise will include the use of mufflers to suppress loud equipment and limitations on the hours of heavy equipment operation.

The dairy farm will utilize milking equipment contained in the milking parlor, and will use field equipment such as tractors. Under HAR §11-46, agriculture is classified as Zoning District Class C, which specifies maximum permissible sound levels of 70 dBA in the daytime and 70 dBA at nighttime. Dairy operations will generate noise in keeping with agricultural zoning of the parcel. The primary noise receptors in the area would be farmers working nearby parcels. Noise from the dairy will not exceed the DOH threshold, and will not contribute to excessive noise in the region.

DEMOGRAPHIC AND ECONOMIC: The potential impacts of Hawai'i Dairy Farms (HDF) to the existing economy were evaluated in the Draft Environmental Impact Statement (EIS), including a fiscal impact assessment report completed in April, 2016 by Plasch Economics Pacific. Draft EIS Section 4.15 addresses demographic and economic factors, with the complete report in Appendix J.

The HDF project would create short-term benefits through jobs for local construction personnel and local material suppliers. Such jobs would include equipment operators, cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, supervisors, painters, etc. Based on State employment multipliers, indirect employment related to Dairy construction would be expected to average about 16 jobs on Kaua'i, and 8 on O'ahu. Construction employment would be expected to average about 12 jobs per year during the development period. Thus direct-plus-indirect employment association with construction would be expected to average approximately 36 jobs, of which 28 would be on Kaua'i.

The HDF project would contribute to diversification of Kaua'i's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Hawai'i Island), approximately10 percent of Hawai'i's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and indirect full-time equivalent jobs on Kaua'i, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on O'ahu.

HDF is expected to generate a net income of approximately $68,000 to the County when the 699 cow herd is established. When the dairy has matured to full production for the 699 cow dairy, net income to the State is calculated at $160,000 annually. With the potential contemplated herd size of up to 2,000 mature dairy cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be

produced. This would double local milk production currently supplied by operational dairies on the Island of Hawai'i.

Additional employment generated by a possible expansion to accommodate the contemplated 2,000 mature dairy cow herd is estimated at approximately 3 construction jobs plus 4 indirect jobs on Kaua'i, and 2 indirect jobs on O'ahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an additional 5 full-time farm jobs would be added, with approximately 15 additional indirect jobs on Kaua'i and another 8 indirect jobs on O'ahu.

The dairy is expected to generate a net additional contribution to the County of approximately $8,000 for improvements related to expansion for the contemplated herd size of up to 2,000 mature dairy cows ($76,000 total versus $68,000 for the committed herd size). The State will derive approximately $360,000 annually in revenues from the contemplated 2,000-mature dairy cow dairy.

Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhā'ulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the

unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhā'ulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Po'ipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhā'ulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawai'i Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhā'ulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhā'ulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhā'ulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow

comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kaua'i community.

Regional Water Demand: The adjacent, developed Kōloa-Po'ipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kaua'i will increase county-wide by 17,300 residents by 2030. The South Kaua'i population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kaua'i region (the Kōloa - Po'ipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhā'ulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhā'ulepū watershed.

The HDF site is located on the bottom-land of the upper Māhā'ulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Ha'upu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhā'ulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kaua'i Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable

to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhā'ulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhā'ulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhā'ulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and

a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Poʻipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator

bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kauaʻi community.

AIR QUALITY: As a part of the Environmental Impact Statement (EIS), existing air quality conditions and project impacts were evaluated, including dust and odor. Potential odors and emission levels for air pollutants relevant to dairy operations were modeled, as currently there are no cows on site. EIS sections 4.19 and 4.25 provide an evaluation of air quality and odors, including a windrose depicting wind speed and direction in the area (see DEIS Section 4.1, Climate). The full air quality technical report can be found in Draft EIS Appendix I.

Clean Air Act

Under the *Clean Air Act of 1970* (CAA), amended November 1990, the U.S. Environmental Protection Agency (EPA) regulates both large and small sources of air pollutants by establishing National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. The State of Hawaiʻi has established its own *State Ambient Air Quality Standards* (SAAQS) that are as strict or, in some cases more strict than the NAAQS. State standards prohibit any visible emissions of fugitive dust from construction activities at the property line.

Emissions relevant to livestock operation include particulate matter and fugitive dust. Greenhouse gases related to dairy cows include methane (CH_4) from enteric fermentation, and both methane and nitrous oxide (N_20) emissions from manure application. No State or Federal regulations for greenhouse gas emissions from farm operations or small businesses currently exist.

DUST

Dust will be generated as cows move along soft limestone walkways that connect the paddocks and lead to and from the milking parlor. Potential fugitive dust emission rates were estimated from published literature, where particulate matter (PM) is measurable from the "drylots" of confined dairy operations where animals walk over dirt and dried manure throughout the day.

Applying the emission rates from this available literature greatly overestimates potential emission resulting from HDF. Cows in the pastoral rotational-grazing system will be on pasture 22 hours each day and will spend two hours – in two separate milking cycles –moving to and from the barn for the 10- to 15-minute milking sessions.

Using atmospheric dispersion modeling system (AERMOD), the rates were scaled to the size of the non-pasture areas used by cows at HDF. Results were added to the background concentration of particulate matter (both PM_{10} and $PM_{2.5}$) measured on the island of Kaua'i, and the total concentration was compared to the State ambient air quality standards. Only the contemplated herd size of up to 2,000 mature dairy cows was modeled, as at the lower threshold of 699 cows, the potential fugitive dust impact would be negligible. The estimated concentration for PM_{10} is 2.01 $\mu g/m^3$, well below the State standard of 150 $\mu g/m^3$. The estimated concentration for $PM_{2.5}$ is 0.23 $\mu g/m^3$, well below the Federal standard of 35 $\mu g/m^3$ (see Draft EIS Section 4.19 and Table 4-19.2).

ODOR

Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF, so air dispersion models were used to determine potential odor levels. Local weather data was used in conjunction with the AERMOD modeling system, and published rates for manure odors emissions for dairy heifers and effluent ponds were adapted to reflect the HDF facilities.

Odor emission sources identified for modeling at HDF were manure in the pasture fields, irrigation water containing diluted nutrients from effluent, the effluent storage ponds, and the dairy buildings. Odor rates from published research were applied. Odor isopleths (a line used to map all points having the same numerical value) were created to display the model findings. Odor is described in "odor units" at the threshold of perception, which is defined by the point at which 50 percent of panelists, in laboratory conditions, cannot smell the odor but 50 percent of the panelists can detect the odor.

Modeling results were generated for worst case meteorological conditions (low wind velocity / mixing). Generally, tradewinds will disperse odors to less than detectable levels beyond the HDF site; in periods of no wind, odor may not be dispersed creating the "worst case" scenario. In these periods without normal tradewind flow, the odor plume would extend to the south of the HDF site. Sections 4.19.2 and 4.25.2 of the EIS include graphics of the potential odor isopleths.

Results for the committed herd size of 699 mature dairy cows show that odors may be detectable by 50 percent of the sensitive population once per 200 hours, or 44 hours per year, within an area that extends approximately 1,670-feet (within one-third of a mile) beyond the dairy farm boundary, and does not reach recreational or residential areas. Results for the contemplated expanded herd size of up to 2,000 mature dairy cows show odors would not extend beyond 2,780 feet outside the HDF boundary (just over half a mile), again not reaching recreational or residential areas, and again with detection limited to 50 percent of the sensitive population approximately 44 hours per year. The parameters used in the analysis were intentionally conservative, and the impacts shown assume an unlikely confluence of worst-case meteorological data, irrigation location, and grazing location. Actual

offsite odor impacts are likely to be much lower and/or less frequent than shown; it is likely odor detection beyond the HDF boundaries will be less frequent.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

From: gjorgens@aol.com [mailto:gjorgens@aol.com]
Sent: Friday, February 20, 2015 4:54 PM
To: McIntyre, Laura
Cc: pesquero@aol.com; gjorgens@aol.com
Subject: Hawaii Dairy Farm Comments to Approving Agency

Dear Laura McIntyre and State of Hawai'i Department of Health,

We received the notice from Group 70 International regarding the Preparation of Environmental Impact Statement for Hawai'i Dairy Farms, LLC. We await the delivery of the Environmental Impact Statement with keen interest in reading its contents. We are vacation rental condo owners at Regency 512 in Poipu Kai and are concerned about the impact the dairy farm may have on the enjoyment and value of our property, and on the environmental well-being of Kauai in general.

Sincerely,

Gayle Jorgens and Stanley Wai
Regency 512
1831 Poipu Road
Koloa, HI 96756

From: gjorgens@aol.com
Sent: Friday, February 20, 2015 4:44 PM
To: HDF
Cc: gjorgens@aol.com; pesquero@aol.com
Subject: Hawaii Dairy Farm Comments for Planning Consultant

Dear John Overton and Group 70 International,

Thank you for sending the notice regarding the Preparation of Environmental Impact Statement for Hawai'i Dairy Farms, LLC. We await the delivery of the Environmental Impact Statement with keen interest in reading its contents. We are vacation rental condo owners at Regency 512 in Poipu Kai and are concerned about the impact the dairy farm may have on the enjoyment and value of our property, and on the environmental well-being of Kauai in general.

Sincerely,

Gayle Jorgens and Stanley Wai
Regency 512
1831 Poipu Road
Koloa, HI 96756

May 26, 2016

Jorgens, Gayle and Wai, Stanley
gjorgens@aol.com

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Jorgens, Gayle and Wai, Stanley:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

DEMOGRAPHIC AND ECONOMIC: The potential impacts of Hawai'i Dairy Farms (HDF) to the existing economy were evaluated in the Draft Environmental Impact Statement (EIS), including a fiscal impact assessment report completed in April, 2016 by Plasch Economics Pacific. Draft EIS Section 4.15 addresses demographic and economic factors, with the complete report in Appendix J.

The HDF project would create short-term benefits through jobs for local construction personnel and local material suppliers. Such jobs would include equipment operators, cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, supervisors, painters, etc. Based on State employment multipliers, indirect employment related to Dairy construction would be expected to average about 16 jobs on Kaua'i, and 8 on O'ahu. Construction employment would be expected to average about 12 jobs per year during the

development period. Thus direct-plus-indirect employment association with construction would be expected to average approximately 36 jobs, of which 28 would be on Kaua'i.

The HDF project would contribute to diversification of Kaua'i's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Hawai'i Island), approximately10 percent of Hawai'i's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and indirect full-time equivalent jobs on Kaua'i, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on O'ahu.

HDF is expected to generate a net income of approximately $68,000 to the County when the 699 cow herd is established. When the dairy has matured to full production for the 699 cow dairy, net income to the State is calculated at $160,000 annually. With the potential contemplated herd size of up to 2,000 mature dairy cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be produced. This would double local milk production currently supplied by operational dairies on the Island of Hawai'i.

Additional employment generated by a possible expansion to accommodate the contemplated 2,000 mature dairy cow herd is estimated at approximately 3 construction jobs plus 4 indirect jobs on Kaua'i, and 2 indirect jobs on O'ahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an additional 5 full-time farm jobs would be added, with approximately 15 additional indirect jobs on Kaua'i and another 8 indirect jobs on O'ahu.

The dairy is expected to generate a net additional contribution to the County of approximately $8,000 for improvements related to expansion for the contemplated herd size of up to 2,000 mature dairy cows ($76,000 total versus $68,000 for the committed herd size). The State will derive approximately $360,000 annually in revenues from the contemplated 2,000-mature dairy cow dairy.

Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

February 23, 2015

Jeff Overton

Group 70 International, Inc.

925 Bethal Street, Fifth Floor

Honolulu, Hawaii 96813

To Whom It May Concern:

This letter is being written to identify the issues which need to be addressed in the Hawaii Dairy Farms EIS related to the New Zealand Method Dairy Farm projected to be established on Kauai's south shore at Maha`ulepu.

1. Procure an impartial party to conduct the EIS.
2. Assess the current levels of pollution in the soil, stream and ocean at Maha`ulepu.
3. Integrate the conclusions of the existing soil and water quality studies that have been done in the area.
4. Include the projected herd size into the EIS.
5. Address the lethality of the proposed effluent ponds.
6. Address the stench that will permeate the surrounding residential and tourist area and decimate our local tourism economy resulting in lost jobs and access to our pristine beaches in the area.
7. State the cumulative effects on the environment.

Thank you for the opportunity to voice my deep concerns related to developing this dairy farm at Maha`ulepu.

Please notify me of everything that happens on this issue in the future phases of the EIS.

Sincerely,

David Judd

4460 Ikena Place # 37

Kalaheo, Hi 96741

May 26, 2016

David Judd
4460 Ikena Place, #37
Kalaheo, HI 96741

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear David Judd:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

GROUP 70 OBJECTIVITY: Group 70 International, Inc. (Group 70) is responsible for the preparation and processing of the Hawai'i Dairy Farms Environmental Impact Statement (EIS). The EIS was prepared in accordance with the requirements of Chapter 343 Hawai'i Revised Statutes and the "Environmental Impact Statement Rules" (Chapter 200 of Title 11, Hawai'i Administrative Rules). The environmental planning team at Group 70 has prepared several hundred Environmental Assessment and EIS documents over the past 40 years, and every document has been accepted by the responsible County, State and Federal agency. On numerous past EIS projects, the Hawai'i Chapter of the American Planning Association has recognized Group 70's professional work with Chapter awards for excellence in environmental planning. Part of the EIS scoping process involves Group 70's experienced team of technical sub consultants that are well-known and qualified in

their respective fields of study. For this project, Group 70 is preparing the Hawai'i Dairy Farms EIS with the level of analysis required to properly evaluate and disclose the existing environmental conditions, probable impacts with mitigation, and potential cumulative and secondary effects.

DAIRY OPERATIONS: Hawai'i Dairy Farms (HDF) will establish and operate a sustainable, pastoral rotational-grazing dairy farm in Māhā'ulepū Valley on the island of Kaua'i to produce fresh, locally available nutritious milk for Hawai'i families. The rotational-grazing method utilizes 100 percent of the cows' manure as natural fertilizer to grow pasture grass as a primary source of nutrition for dairy cows. This cost-effective method will reduce reliance on imported fertilizer and feed. Pasture grass will comprise at least 70 percent of the animals' diet. As a part of the Draft Environmental Impact Statement (EIS), the proposed facilities and operations for the dairy farm are described in Chapter 3.

The Environmental Impact Statement (EIS) Preparation Notice (EISPN), published January 23, 2015, described the proposed pasture-based rotational grazing system as a "zero-discharge, grass-fed dairy". The term "zero-discharge" under the U.S. Environmental Protection Agency related to concentrated feeding operations (CAFO) is a system designed to not discharge pollutants into waters of the United States. As noted previously, the HDF system is designed to utilize 100 percent of the cows' manure on-site. However, nutrients would be introduced to the HDF site with any use; the Draft EIS identifies the amount of nutrients anticipated from the proposed dairy operations that could pass through to ground and surface waters. Therefore, HDF elected to discontinue use of the term "zero discharge" as it was construed as no nutrients into the system.

The term "grass-fed" was used in the HDF EISPN. This term was used to identify HDF's intent to utilize a locally-produced feedstock – grass – for more than 70 percent of the dairy herds' diet. In January 2016, the U.S. Department of Agricultural (USDA) Marketing Survey created a narrow legal definition of "grass-fed". The USDA standard defines what animals can and cannot be fed. The Food Alliance, a project of several northwest colleges, believes that when consumers choose grass-fed products there is an expectation that these will come from animals raised on pasture on a forage-based diet. Due to the evolving definition of "grass-fed", the term in not used in this EIS.

The dairy facilities will occupy an area of approximately 10 acres on the western boundary of the site. The developed area "footprint" will be less than 2 percent of the total farm area. Four buildings will be constructed to serve different functions, supported by utilities and infrastructure. Additional building information can be found in Draft EIS Section 3.3.1.

Agricultural infrastructure and utilities required for the dairy operations will include storage tanks and silos, effluent storage ponds, livestock water systems, and drainage improvements. The irrigation system and distribution of livestock water are discussed in Draft EIS Section 3.5, Pasture Management.

The pastoral rotational-grazing dairy provides a local feedstock – grass – as the herd's primary food source. Reducing imported feed stabilizes costs and provides a food source closer to the natural diet of cows. Results of grass trials initially conducted at five sites across four Hawaiian Islands were instrumental in identifying appropriate varieties of grass, and suitable sites to support sufficient "dry matter" grass yields essential to a cow's diet. Additional project-specific trials at the Māhāʻulepū site on Kauai have been conducted for more than 18 months. The results have identified sufficient yield and nutrition to supply 70 percent of the cows' diet; improvements in grass productivity are anticipated to provide up to 85 percent of cows' diet.

The pasture-based model allows cows to move about freely, and to lie down and rest, which is part of the digestion cycle. The animals are managed in social groups known as "mobs", mimicking the natural social order of bovines. Cows spend 22 hours of each 24-hour period foraging on pasture or resting, outdoors in natural light and fresh air. The gently sloped paddocks, walkways and races minimize the energy expended by the mature dairy cows as they graze or are transferred to and from the various paddocks and the mature dairy facility; surfaces of the walkways and cow races are designed to provide a comfortable path under hoof. The management practices and pasture model applied by HDF maximizes grass as the cows' primary nutrition source and minimizes stress to the animals. Cows tend to be healthier and live longer, productive lives with access to fresh air, high quality feed, and exercise while they forage.

The 470 acres of pasture will be divided into paddocks averaging 3 to 5 acres in size. Smaller paddocks located near the dairy facility will be used as temporary pasture for cows or calves being moved on or off the farm. To protect the water quality of surface water and downstream areas, paddock fences are set back 35 feet from the edge of drainage ways throughout the site. Existing vegetation within the setbacks will be managed or restored to reduce erosion, improve stability of ditch banks, increase net carbon storage, and improve and maintain water quality.

The majority of the pastures will be irrigated with non-potable water and/or diluted effluent through either the pivot irrigation systems or through gun irrigators. Irrigation water supply is provided to the farm from Waita Reservoir, and will be filtered and pumped to the various irrigation components on the farm. The irrigation system is controlled using computer software and GPS receivers to allow very precise application of irrigation and/or diluted effluent on the pasture. The pivots can rotate and apply irrigation water and/or diluted effluent at different rates depending on the actual irrigation needs of the farm.

NRCS provides technical guidance on applying agricultural waste depending on the desired use of the waste. Reflected in the title of the livestock waste guidance for Hawaiʻi is the parenthetical inclusion of the word "nutrients." Where waste is utilized as a resource, it is being used for the constituent components that provide benefit.

The NRCS Conservation Practice Standard 590, Nutrient Management, applies to commercial fertilizers, organic by-products, waste water, organic matter, and

irrigation water. Nutrient management is the practice of managing the amount, rate, source, method of application, and timing of plant nutrients and soil amendments. The timing and application of nutrients will correspond with plant uptake, soil properties and weather conditions. For more information on nutrient balance management see Draft EIS Section 3.5.3, and Draft EIS Appendix D.

The effluent storage ponds are sized to accommodate 30 days of storage for up to 2,000 mature dairy cows, and over 85 days of storage for 699 mature dairy cows. It will be highly unlikely that the storage pond will be full at any time for the contemplated 2,000-cow dairy, and nearly impossible for the committed 699-cow dairy. Throughout the less than 30-day storage period, effluent is planned for application every four days, and the slurry application is expected at least once every 45 days, to ensure that the ponds are kept at manageable levels.

Cows lactate milk following the birth of calves. Newborn calves will be housed on the Māhāʻulepū site and provided essential colostrum and nutrients for a healthy start. During the calves' initial 90 days, they will be transitioned to pasture at HDF before transfer to ranches on Kauaʻi to be raised off-site. The committed herd size of 699 mature dairy cows at the Māhāʻulepū site applies to mature mature dairy cows. Animals in various stages of lactation and rest will be transferred between HDF and other partner ranches as needed for animal health and dairy productivity. This will benefit both the dairy and infuse the beef market in Hawaiʻi with a new, local source of pasture-raised calves. Male calves will become part of the beef cattle herd; heifers (young female calves that haven't given birth) will be raised until ready to return to the HDF herd as a birthing/mature dairy cow. For more information on off-site herd management, refer to Section 3.7 of the Draft EIS.

Health of the herd is of primary importance as the success of a dairy relies on cows effectively producing quality milk. All cows will be treated with a high standard of care. Dairy managers and caretakers will be trained and competent in handling animals to minimize stress and ensure the herds' welfare. A licensed veterinarian may prescribe use of antibiotics approved by the Food & Drug Administration (FDA) for treatment of illnesses. Adherence to guidelines that prohibit milk from cows undergoing antibiotic treatment will ensure no adulteration of milk. Routine laboratory tests of milk for traces of antibiotic residue will be conducted. HDF will not inject cows with bovine growth hormone, referred to as rBST or rBGH.

SOILS: Soil is an ecosystem that can be managed to provide nutrients for plant growth, to absorb and hold rainwater for use during dryer periods, to filter and buffer potential pollutants from leaving fields, to serve as a firm foundation for agricultural activities, and to provide habitat for soil microbes to flourish and diversify to keep the ecosystem healthy. Two rounds of independent soil sampling were undertaken at HDF to understand and characterize available soil nutrients and conditions. Section 4.3 of the Environmental Impact Statement (EIS) characterizes soil conditions, and anticipated impacts from effluent and supplemental nutrient application. Recommendations from Dr. Russell Yost and Nicholas Krueger of the University of Hawaiʻi at Mānoa are summarized. Their baseline nutrient report is included as Appendix C of the Draft EIS.

Soil conservation is a core principal behind establishment of the NRCS, which was formed out of the Soil Conservation Service to acknowledge its expanded role in watershed-scale approach using science-based tools and standards in agronomy, engineering economics, wildlife biology and other disciplines to aid landowners in implementation of conservation practices. NRCS conservation practices are listed in Chapter 3, Section 3.2; these practices codes identify design and construction standards related to drainage, materials, operations and applicable engineering standards. HDF will follow the developed Conservation Plan, which was approved by the West Kaua'i Soil & Water Conservation District in December, 2013.

The United States Department of Agriculture (USDA) Natural Resources Conservation Services (NRCS) has mapped and classified soils for more than 95 percent of the United States. Comments received during the initial scoping for this EIS included a "Custom Soils Resource Report for Island of Kaua'i, Hawai'i." The report was generated from the USDA NRCS website, which allows any internet user to define an area of interest, customize data results, and generate a Custom Soil Resource Report. The user can select or deselect parameters based upon which data the user would like to display. These user-generated reports are not evaluated by NRCS.

The NRCS soils classifications and descriptions provide a good information base, however, in-field soils testing is needed to identify existing soil nutrient levels and conditions. The most abundant soil types at the HDF site are Kalihi Clay at 32 percent, Ka'ena Clay Brown Variant at 29 percent, and Lualualei Clay at roughly 14 percent of the dairy site. Laboratory analysis of soil samples collected in 2014 identified levels of pH, phosphorus, nitrogen, potassium, calcium, magnesium, organic matter, salinity, micronutrients and other constituents. The results illustrate that the soils are depleted of nutrients, which is typical for lands formerly used for sugarcane. The soil nutrient status and fertility demands of the primary crop, Kikuyu grass, were used to identify the quantities of nutrients required for productive grass growth. The soils data provide a baseline to guide adaptive nutrient management throughout establishment and maturity of the dairy.

A second round of field sampling was conducted in 2015, and focused on evaluation of soils characterized as "poorly drained", and established a quantitative baseline of soil salinity and sodicity to provide for future monitoring of soil health with application of manure effluent. Laboratory analysis determined electrical conductivity and exchangeable sodium percentage, in addition to nutrient levels of nitrogen phosphorus calcium, magnesium, and potassium.

Poorly drained is not an indication of low or poor infiltration. Infiltration refers to the ability of water to enter the soil surface, whereas "drainage" refers to the movement of water within or from the soil profile. Poorly drained soils typically have low hydraulic conductivity, or a slow rate of groundwater movement through the soil. This slow movement can create anaerobic conditions, which typically result in higher rates of denitrification. This is the conversion of potentially nitrates and nitrites to gaseous forms, which reduces the potential for impacts on waterbodies.

In this way, "poorly drained" soils may represent less risk of nitrate and nitrite leaching to associated waterbodies than "well drained" soils (Yost, 2016).

As a result of reduced movement of water through the soil profile, the mobility of nutrients such as potassium and phosphorus is also reduced. Soil types at the HDF site are known to adsorb and retain large amounts of phosphorus. Under the NRCS phosphorus leaching index for Hawai'i soils, HDF soils show low risk for leaching. With low risk, phosphorus can be applied at rates greater than crop requirements if manure or other organic materials are used to supply nutrients.

The dairy's focus on robust and healthy grass growth will build organic matter in soils through use of manure as a natural fertilizer. Soil can incorporate carbon from the atmosphere, which benefits soil health. According to recent studies in the Soil Science Society of America Journal, the conversion of formerly tilled cropland to grazed pasture can drive substantial accumulation of organic carbons in soil, with a potential to offset up to one-third of the annual increase in atmospheric carbon dioxide. The potential soil organic matter and carbon dioxide sequestration benefits are likely greatest in highly degraded soils in warm subtropical climates, partly due to long pasture-growing seasons. Long-term soil impacts are anticipated to result in improvement to the physical, chemical, and biological condition of the soil.

DEMOGRAPHIC AND ECONOMIC: The potential impacts of Hawai'i Dairy Farms (HDF) to the existing economy were evaluated in the Draft Environmental Impact Statement (EIS), including a fiscal impact assessment report completed in April, 2016 by Plasch Economics Pacific. Draft EIS Section 4.15 addresses demographic and economic factors, with the complete report in Appendix J.

The HDF project would create short-term benefits through jobs for local construction personnel and local material suppliers. Such jobs would include equipment operators, cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, supervisors, painters, etc. Based on State employment multipliers, indirect employment related to Dairy construction would be expected to average about 16 jobs on Kaua'i, and 8 on O'ahu. Construction employment would be expected to average about 12 jobs per year during the development period. Thus direct-plus-indirect employment association with construction would be expected to average approximately 36 jobs, of which 28 would be on Kaua'i.

The HDF project would contribute to diversification of Kaua'i's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Hawai'i Island), approximately10 percent of Hawai'i's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and indirect full-time equivalent jobs on Kaua'i, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on O'ahu.

HDF is expected to generate a net income of approximately $68,000 to the County when the 699 cow herd is established. When the dairy has matured to full production for the 699 cow dairy, net income to the State is calculated at $160,000 annually. With the potential contemplated herd size of up to 2,000 mature dairy cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be produced. This would double local milk production currently supplied by operational dairies on the Island of Hawai'i.

Additional employment generated by a possible expansion to accommodate the contemplated 2,000 mature dairy cow herd is estimated at approximately 3 construction jobs plus 4 indirect jobs on Kaua'i, and 2 indirect jobs on O'ahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an additional 5 full-time farm jobs would be added, with approximately 15 additional indirect jobs on Kaua'i and another 8 indirect jobs on O'ahu.

The dairy is expected to generate a net additional contribution to the County of approximately $8,000 for improvements related to expansion for the contemplated herd size of up to 2,000 mature dairy cows ($76,000 total versus $68,000 for the committed herd size). The State will derive approximately $360,000 annually in revenues from the contemplated 2,000-mature dairy cow dairy.

Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhā'ulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhā'ulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Po'ipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhā'ulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawai'i Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhā'ulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhā'ulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhā'ulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no

animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kaua'i community.

Regional Water Demand: The adjacent, developed Kōloa-Po'ipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kaua'i will increase county-wide by 17,300 residents by 2030. The South Kaua'i population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kaua'i region (the Kōloa - Po'ipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhā'ulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhā'ulepū watershed.

The HDF site is located on the bottom-land of the upper Māhā'ulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Ha'upu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhā'ulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed

in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kaua'i Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhā'ulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhā'ulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhā'ulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected

from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Poʻipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment

which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kauaʻi community.

AIR QUALITY: As a part of the Environmental Impact Statement (EIS), existing air quality conditions and project impacts were evaluated, including dust and odor. Potential odors and emission levels for air pollutants relevant to dairy operations were modeled, as currently there are no cows on site. EIS sections 4.19 and 4.25 provide an evaluation of air quality and odors, including a windrose depicting wind speed and direction in the area (see DEIS Section 4.1, Climate). The full air quality technical report can be found in Draft EIS Appendix I.

Clean Air Act

Under the *Clean Air Act of 1970* (CAA), amended November 1990, the U.S. Environmental Protection Agency (EPA) regulates both large and small sources of air pollutants by establishing National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. The State of Hawaiʻi has established its own *State Ambient Air Quality Standards* (SAAQS) that are as strict or, in some cases more strict than the NAAQS. State standards prohibit any visible emissions of fugitive dust from construction activities at the property line.

Emissions relevant to livestock operation include particulate matter and fugitive dust. Greenhouse gases related to dairy cows include methane (CH_4) from enteric fermentation, and both methane and nitrous oxide (N_20) emissions from manure application. No State or Federal regulations for greenhouse gas emissions from farm operations or small businesses currently exist.

DUST

Dust will be generated as cows move along soft limestone walkways that connect the paddocks and lead to and from the milking parlor. Potential fugitive dust emission rates were estimated from published literature, where particulate matter (PM) is measurable from the "drylots" of confined dairy operations where animals walk over dirt and dried manure throughout the day.

Applying the emission rates from this available literature greatly overestimates potential emission resulting from HDF. Cows in the pastoral rotational-grazing system will be on pasture 22 hours each day and will spend two hours – in two separate milking cycles –moving to and from the barn for the 10- to 15-minute milking sessions.

Using atmospheric dispersion modeling system (AERMOD), the rates were scaled to the size of the non-pasture areas used by cows at HDF. Results were added to the background concentration of particulate matter (both PM_{10} and $PM_{2.5}$) measured on the island of Kaua'i, and the total concentration was compared to the State ambient air quality standards. Only the contemplated herd size of up to 2,000 mature dairy cows was modeled, as at the lower threshold of 699 cows, the potential fugitive dust impact would be negligible. The estimated concentration for PM_{10} is 2.01 $\mu g/m^3$, well below the State standard of 150 $\mu g/m^3$. The estimated concentration for $PM_{2.5}$ is 0.23 $\mu g/m^3$, well below the Federal standard of 35 $\mu g/m^3$ (see Draft EIS Section 4.19 and Table 4-19.2).

ODOR

Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF, so air dispersion models were used to determine potential odor levels. Local weather data was used in conjunction with the AERMOD modeling system, and published rates for manure odors emissions for dairy heifers and effluent ponds were adapted to reflect the HDF facilities.

Odor emission sources identified for modeling at HDF were manure in the pasture fields, irrigation water containing diluted nutrients from effluent, the effluent storage ponds, and the dairy buildings. Odor rates from published research were applied. Odor isopleths (a line used to map all points having the same numerical value) were created to display the model findings. Odor is described in "odor units" at the threshold of perception, which is defined by the point at which 50 percent of panelists, in laboratory conditions, cannot smell the odor but 50 percent of the panelists can detect the odor.

Modeling results were generated for worst case meteorological conditions (low wind velocity / mixing). Generally, tradewinds will disperse odors to less than detectable levels beyond the HDF site; in periods of no wind, odor may not be dispersed creating the "worst case" scenario. In these periods without normal tradewind flow, the odor plume would extend to the south of the HDF site. Sections 4.19.2 and 4.25.2 of the EIS include graphics of the potential odor isopleths.

Results for the committed herd size of 699 mature dairy cows show that odors may be detectable by 50 percent of the sensitive population once per 200 hours, or 44 hours per year, within an area that extends approximately 1,670-feet (within one-third of a mile) beyond the dairy farm boundary, and does not reach recreational or residential areas. Results for the contemplated expanded herd size of up to 2,000 mature dairy cows show odors would not extend beyond 2,780 feet outside the HDF boundary (just over half a mile), again not reaching recreational or residential areas,

and again with detection limited to 50 percent of the sensitive population approximately 44 hours per year. The parameters used in the analysis were intentionally conservative, and the impacts shown assume an unlikely confluence of worst-case meteorological data, irrigation location, and grazing location. Actual offsite odor impacts are likely to be much lower and/or less frequent than shown; it is likely odor detection beyond the HDF boundaries will be less frequent.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

From: Terrie Hayes
To: HDF; epo@doh.hawaii.gov
Subject: EIS, CIA/CIS, AIS
Date: Monday, February 23, 2015 4:04:19 PM

We attended the HDF meeting for EIS, aka "dog and pony show"

(TGI, FEB 21,2015) http://thegardenisland.com/news/local/dairy-plans-move-ahead/article_82bfc036-b986-11e4-ba30-3b4dd074ffa2.html

in Koloa town,held only 3 days prior to the deadline for comments.

It felt more like "snake oil" salesmen, attempting to sell their magic Elixir (milk) at a traveling circus!

More troubling was what I witnessed;

The station presenters, repeatedly instruct their "scribes" as to WHAT to write,

transforming many comments and concerns into watered-down questions.

For example:

I asked "Why is Water not considered or included In the Cultural Impact Statement (CIS) / Cultural Impact Assessment(CIA)?"

The scribe wrote "Is water included in the CIS?"

The latter requires a simple No for an answer.

I observed this occur more than once.

Also, I QUESTIONED ALL OF THE STATIONS, of which there were four:
Water, Air , Cultural and Waste management.

A bit puzzling, as there many other triggers for an EIS, as in ENDANGERED SPECIES CONCERNS,

or PUBLIC HEALTH CONCERNS. Neither had a presenter to address these important issues.

I therefore believe and request that another unbiased EIS evaluator act in the capacity of consultant, not Group 70.

I brought up SUB-SURFACE CONSIDERATIONS, as related to AIS, CIS/CIA, Water and Waste management.

Also,we informed the Oahu presenters of the incredible WINDS we have here on the southshore, the air is bad enough from VOG.

And what about the COWS in the event of a Tsunami? We have evacuated three times in the past three years,

there is not an emergency plan is HDF proposal.

Participants were also encouraged to LEAVE the Comment sheet provided.

Will these REALLY be addressed in the EIS, or just published, written down on paper, as THEY STATED?

As for the proposed Dairy, we have many concerns that need to be addressed in the EIS.

Please be advised we have filed a report with DLNR, Aha Moku Advisory Committee, of which Billy Kaohelauli'i

is the KONA MOKU for Manokalanipo (Kaua'i), Document attached, dated 12/08/2014.

PLEASE consider this information, as it has been currently filed with SHPD.

Maha'ulepu is a SACRED SITE, and must be protected for future generations.

Appropriate, sustainable farming is what the IAL designated lands were meant to provide in Maha'ulepu Valley,

not an inappropriate INDUSTRIAL venture. The unique soil type (grey Hydromorphic with high clay component) is perfect for Kalo (Taro).

Other appropriate crops would also fare well in this valley.

AND THEN THERE IS THE WATER;

THREE wells that provide our drinking water for our community, uncomfortably near their proposed location.

HDF cannot guarantee these wells will not be contaminated, or what they will do if they are contaminated.

The Close proximity to our beautiful undeveloped beach is also at great risk of contamination, as well as the entire FRAGILE REEF ECOSYSTEM.

There is already evidence of contaminated Waiopili spring and in the Maha'ulepu /Gillian's Beach ocean area (Blue Water Task Force/ Surfrider Kaua'i).

THIS MUST BE ADDRESSED IN THE EIS.

Please find the dairy another location, preferably in another STATE.

Sincerely,

Billy Kaohelauli'i (Kona Moku, Manokalinpo)

and

Terrie Hayes

2249 Kaui Rd.

Koloa, Hi. 96756

Hard copy to follow.

Aha Moku Advisory Committee
C/o Department of Land & Natural Resources
1151 Punchbowl St., Ste. 130
Honolulu, HI 96813
Phone: 808-587-1498

Manokalanipo (Kaua'i) – Kona Moku Report Form

This form is used for areas and ahupua'a within the moku of Kona, Manokalanipo (Kaua'i) when an issue or concern impacts a natural and cultural resource within its specific land or ocean district. Ahupua'a are: Kona – Mahaulepu, Pa'a, Weliweli, Koloa, Aepo, Lawai, Kaiaheo, Wahiawa, Hanapepe, Kupua, Makaweli, Waimea, Kapena, and Kekaha.

Date: 12/8/14 Case no: _____

Name of applicant (or Hui, if applicable): Llewelyn (Billy) Kaohelau'li, Aha Moku (Kona District)

Address of applicant/hui: 2249 Kuai Rd. Koloa, HI 96756

Contact Phone: 808-742-9575 Email: terriehayes@gmail.com

Ahupua'a/ Moku: Maha'ulepu Ahupua, Kona District

Check as many as applies to the issue you are reporting:

X Natural resource

X Cultural resource

X Traditional Hawaiian practice

1. Briefly describe the issue/ situation in which a resource(s) and/or traditional Hawaiian practice is affected:
If Hawaii Dairy Farms is allowed to import 699 cows to Maha'ulepu Valley, the local Hawaiian people will be kept from collecting medicinal plants and waters from the valley. Once fences and cows arrive, Hawaiian fishing practices will be greatly impacted by 3 million lbs. of manure and 210,000 gallons of urine per month that will be deposited on the land and will runoff to the nearby sea (less than 1 mile away).

2. Describe the impact (negative) that will occur or is occurring to the environment or traditional Hawaiian practice as a result of the issue you are reporting:
The massive waste HDF cows will produce (>143 lbs/day/cow) is to be left where it falls with no plan for removal. Direct runoff from the proposed farm site via the Waiopili stream has been confirmed. Cow manure has been shown to be an equivalent health risk to human sewage. Current swimming and fishing practices by Hawaiians will be greatly impacted.

3. Identify the 'ahupua'a, moku and/ or mokupuni residents impacted by the issue that you are reporting (in general): Native Hawaiian and local residents of Kaua'i, Aha Moku Billy Kaohelauli'i, Kona district, and all the residents and visitors to the AHA'PUAA.

4. If applicable, describe the steps (if any) taken so far to try to resolve the issue:
etters have been sent to the Governor; the Director, DOH; Director, Department of Land & Natural esources; Board of Directors; and Management Personal, Hawaii Dairy Farms / Ulupono Initiative; layor, County of Kau'i, Bernard Carvalho, Jr.; The Entire County Council of Kauii and its Directors. the Planning & Public Works Department, expressing concern for the impact to traditional cultural practices.

5. Describe any practice in use presently that is consistent with (a) maintaining the health of the area affected and (b) maintaining established indigenous Hawaiian customs:
At present, the area supports established agriculture including a taro farm. The limited development includes the taro farm which HDF is proposing to surround by cows, pastures butting right up to the edge of the Lo'i. The Nakawahi Cave Preserve which is adjacent to the property is an extensive native Hawaiian plant restoration site. The area was also the subject of a National Parks Survey, proposing Hawaiian Plant Restoration site. The area was also the subject of a National Parks Survey, proposing it as a National Park. Also site of subsistence fishing, gathering, & hunting.

Length of time in practice:
Native cultural practices have extended back to the polynesians first arrival w/ reased spiritual importance following the defeat of King Kamehameha's army. The renewed cus on saving/preserving endemic & native species began about 45 years ago w/ the archeological studies of the Nakawahi cave.

6. Please attach or note any data, evidence or support that can substantiate your position and provide assistance for the 'Aha Moku Advisory Council in determining appropriate follow-up procedures.
Attachments include electronic transferrital of NRCS custom soil study (6/5/14), National Park Service conformance Survey (2007), objection letters filed with the above (4/13 - present), public comment from Ahupuaa ibosts, Kawailoa development LLP, Report on the Environment and Nationwide Pollution problem by the Dependent Parliamentary Commissioner for the Environment (New Zealand 2013), Aerial photos showing flow and potential ditch/stream runoff, SHPD response to AIS (12/3/14)

7. Are there any residents *of the identified area* who have opposing views, contrasting management methods, or other interests? ___ yes ✗ no

Please describe:
The identified area is undeveloped and all nearby residents are opposed to the proposed industrial scale dairy. Through this complaint, the Ahupuaa Moku implores the State to act to prevent the certain environmental desecration and disruption of cultural & native practices that will undoubtedly occur with the introduction of massive untreated animal waste.

If possible, can you suggest a compromise or alternative solution that you are willing to consider, that can help resolve the issue in a way that satisfies both parties' positions, *in keeping with* the principles of resource protection and traditional Hawaiian practices?
THERE IS NO COMPROMISE AT THIS SITE THAT WOULD ACHIEVE RESOURCE PROTECTION AND PRESERVATION OF TRADITIONAL HAWAIIAN PRACTICES. RELOCATION TO ANOTHER SITE IS THE ONLY SUSTAINABLE COMPAMISE

* The 'Aha Moku Advisory Council needs to know this information in order to fully assess the reported issue, determine whether or not the reported issue is consistent with our directives as an advisory council advocating traditional Hawaiian Resource management, and if so, to help us determine our recommendations to forward to the Department of Land and Natural Resources.

* For the purpose of establishing a common understanding to the term relevant to our directives as the 'Aha Moku Advisory Council, "Traditional Hawaiian practice" is identified as: *a set of performance characteristics in a discipline, that has been maintained long enough to have become a custom, and has been practiced by indigenous Hawaiian people in a sequence of generations that precedes the modern Hawaiian era.*

For Aha Moku Advisory Committee, DLNR, BLNR only

APPLICANT

Billy KAOHELAULII
Please print name of applicant and/or Hui

2249 KUAI Rd KOLOA, HI 96756
Address of applicant/Hui

Terriehayes@gmail.com (808) 742-9575
Email Phone

Llewelyn (Billy) Kaohelaulii 11/25/14
Signature of Applicant / Hui Date

AHUPUA'A

LLEWELYN H KAOHELAULII WELI WELI
Please print name of ahupua'a representative Ahupua'a

2249 KUAI RD KOLOA, HI 96756
Address of ahupua'a representative

Terriehayes@gmail.com (808) 742 9575
Email Phone

Llewelyn (Billy) Kaohelaulii 12/8 2014
Signature of Ahupua'a Representative Date

MOKU

LLEWELYN H. KAOHELAULII KONA
Please print name of Moku representative Moku

2249 KUAI RD. KOLOA, HI 96756
Address of Moku representative

Terriehayes@gmail.com (808) 742 9575
Email Phone

Llewelyn (Billy) Kaohelaulii 12/8/2014
Signature of Moku Representative Date

AHA MOKU ADVISORY COMMITTEE (AMAC) MEMBER (PO'O)

Please print name of Aha Moku Advisory Committee member (AMAC)

S/(Tommy Hashimoto) 12/16/2014

Signature of AMAC member — Date

(P.oo - Kauai AHA MOKU)

Address of AMAC member — Email

Contact Phone

(Attach findings and recommendations)

GROUP 70 INTERNATIONAL

May 26, 2016

Hayes, Terrie and Kaohelauli'i, Billy
2249 Kaui Road
Koloa, HI 96756
terriehayes@gmail.com

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Hayes, Terrie and Kaohelauli'i, Billy:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

NATURAL HAZARDS: The potential impacts of natural hazards are evaluated in the Draft Environmental Impact Statement (EIS), including flooding, tsunami, earthquakes, and hurricanes. Draft EIS Section 4.6 addresses natural hazards.

The Māhā'ulepū property is not known to experience flooding conditions. The area is located within Federal Emergency Management Agency (FEMA) Zone X, areas determined to be outside the 0.2% annual chance floodplain. The proposed location for Hawai'i Dairy Farms (HDF) lies between the 60 and 150 feet elevation, outside the tsunami evacuation zone. The Kaua'i and Ni'ihau region of the Hawaiian Islands has experienced tremors from earthquakes originating further south in the island chain, but no known seismic activity has originated among these northern islands.

Group 70 International • 925 Bethel Street, 5th Floor • Honolulu, HI 96813-4307 • tel. 808.523.5866 • fax. 808.523.5874 • www.group70int.com

Although they occur infrequently, Kaua'i has received a greater amount of damage from hurricanes when compared to the other Hawaiian Islands. Land management personnel in the Māhā'ulepū region during and following the hurricanes that affected Kaua'i in 1982 and 1992 observed defoliation of vegetation, and no flooding events in the period following passage of the storms.

Preparedness is the best protection for natural disasters. Structural design of dairy facilities will meet International Building Code (IBC) 2006 standards with local amendments. Provisions in design will address wind loading (including hurricane gusts), rain and flood loading, and earthquake loading. A geotechnical evaluation of the area recommended Seismic Site Class D under IBC standards be utilized for foundation design where the barns and agricultural infrastructure will be constructed.

There has been no rainfall event that would exceed the capacity of the effluent ponds since rainfall has been recorded in Māhā'ulepū Valley. The effluent pond capacity has been designed above the regulatory requirement to contain the 25-year, 24-hour rainfall event. An emergency containment berm with additional capacity for another 30 days is included in the design. This design exceeds regulatory requirements, with containment in excess of the major rainfall events recorded on Kaua'i over the past three decades.

An emergency preparedness plan for protection of animals has been prepared for HDF internal use that addresses hurricane, fire, and potential flooding hazard scenarios. HDF is not in a tsunami inundation area, so this scenario is not planned for in the disaster plan. The disaster plan relies upon knowledge of cow behavior, and is based on extensive guidance for livestock protection from NRCS, the Florida State Agricultural Response Team (SART), Pennsylvania State College of Agricultural Sciences, and Cornell University Cooperative Extension. The plan includes safety procedures during any disaster, follow up actions, and emergency contacts for assistance before, during or following the event. Further information is provided in the Draft EIS Section 4.6.2.

ARCHAEOLOGICAL AND CULTURAL: The Hawai'i Dairy Farms (HDF) project is subject to a historic preservation review by the State Department of Land and Natural Resources, State Historic Preservation Division (SHPD) under HRS Chapter 6E and Chapter 13-284. An Archaeological Inventory Survey (AIS) and a Cultural Impact Assessment (CIA) were conducted by Scientific Consultant Services (SCS) for the proposed project. EIS Sections 4.7 and 4.8 provide an evaluation of archaeology and cultural resources, with technical studies in Appendix G and H.

A total of sixteen historic properties were identified through a pedestrian survey of the project area and an extended survey area of 100 meters of the northern boundary. Six historic-era sites occur in the project area and 10 sites occur in the extended survey area. Only one of the sites is believed to be associated with pre-Contact and/or early historic times. State Site 50-30-10-2250, the agricultural heiau, and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area. The remaining sites consist of historic-era bridges, ditches, culverts,

retaining walls, and a flume system dating from the 20th century and are affiliated with sugarcane cultivation.

That a majority of the documented sites are related to the historic-era is not surprising, given the massive landscape modifications that occurred during intensive sugarcane cultivation on the valley floor. Even historic era cultural materials associated with the many Land Commission Awards in the project area were non-existent, as explored through survey and subsurface exploration.

The sixteen historic properties have been assessed for significance by the archaeological consultant and the dairy project is anticipated to have no impact on these sites. No further archaeological work is recommended for the sites. Two of the sixteen sites are considered significant under multiple criteria, but occur outside the project area on lands owned by a different landowner. Both sites will not be adversely affected by the proposed dairy project. No site is related to burials, and no bonex were found. Such sites have been reported along coastal areas in sand dunes.

The cultural assessment examined the potential effect of the project on cultural resources, practices or beliefs, its potential to isolate cultural resources, practices or beliefs from their setting, and the potential of the project to introduce elements which may alter the setting in which cultural practices take place. Information received from the community indicates the Māhā'ulepū Ahupua'a, has been and is currently used for traditional cultural purposes. However, the dairy project area has not been included in these activities. It is clear that the gathered plants, trails, State Site 50-30-10-2250, the agricultural heiau, and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area.

The project will be fully enclosed by perimeter fencing along the boundary of the leased premises, which will ensure that project activities and any related impacts are contained within the project area. Based on the research and comments received from the community, it is reasonable to conclude that, pursuant to Act 50, the exercise of native Hawaiian rights or any ethnic group related to numerous traditional cultural practices will not be impacted by establishment of the dairy.

FLORA AND FAUNA: Botanical, avian, and mammalian surveys of the property were conducted for the Draft Environmental Impact Statement (EIS) to assess existing species on site, including identifying any species listed as endangered, threatened, or proposed under any state or federal endangered species programs in or near the property. EIS Sections 4.9 and 4.10 address the evaluation of flora and fauna resources, with technical studies in Appendix A and B.

A botanical survey of the dairy property was conducted in August 2014 by AECOS Consulting to assess existing plant species. The survey also investigated for the presence of plants currently listed as endangered, threatened or proposed for listing under Federal or the State of Hawai'i's endangered species programs, located onsite or within the immediate vicinity of the dairy site. The nature of the land and its present and historical uses for intensive agriculture very much limit the natural botanical resources anticipated to occur on this land. Complete species lists are included in the EIS, and no protected botanical species occur on the project

property. The project will include vegetated buffer strips along the drainage ways as part of the Conservation Plan to reduce erosion and stabilize slopes. Where native plants occur or could survive if planted, native plants will be used in the stabilization. No long-term impacts to native plant habitats or endangered or threatened plants species will occur as a result of the dairy.

Avian and mammalian surveys were conducted in August 2014 by Rana Biological Consulting, Inc. This survey was conducted to assess the potential presence of avian or mammalian species currently listed as endangered, threatened or proposed for listing under either Federal or the State endangered species lists. The survey covered the dairy site area and immediate vicinity. Common birds and terrestrial mammals were encountered on the property. There is no critical habitat for endangered species in the upper Māhāʻulepū Valley.

Four species of endangered waterbirds were recorded on the site and at the nearby taro farm located within the HDF site. Though the area does not provide critical habitat, seabirds that nest in upland areas of Kauai may overfly the site. The endangered Hawaiian goose, nēnē was also seen on the site. State Division of Forestry and Wildlife biologists have noted nēnē are regularly seen on the subject property. It is probable that some nest on or adjacent to the site as this species nests in the general Kōloa area, and the habitat present on parts of the site is suitable for nēnē nesting.

The principal potential impacts posed to the five endangered species include those potentially associated with construction activities, and those associated with dairy farm operations following build-out. Measures will be adopted to avoid potential seabird and nēnē goose collisions with fences and structures. Potential measures include lowering construction cranes at night, using conservation fencing to project-specified areas, marking tall structures and fencing with white visibility polytape, limiting nighttime lighting, and shading any outside lights used at night. Ongoing mitigation strategies will be implemented for day-to-day preventative measures, including an Avian Species Protection Plan. Mitigation measures are further described in DEIS Section 4.10.2.

It is also likely that Hawaiian hoary bats overfly the project area on a seasonal basis. While caution will be taken during any potential disturbance or vegetation removal, there are almost no suitable roost trees within the dairy site, thus it is expected that the dairy farm will not affect this listed mammalian species.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawaiʻi Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhāʻulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhāʻulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Poʻipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhāʻulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawaiʻi Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhāʻulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhāʻulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhāʻulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kaua'i community.

Regional Water Demand: The adjacent, developed Kōloa-Po'ipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kaua'i will increase county-wide by 17,300 residents by 2030. The South Kaua'i population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kaua'i region (the Kōloa - Po'ipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhāʻulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhāʻulepū watershed.

The HDF site is located on the bottom-land of the upper Māhāʻulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Ha'upu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhāʻulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kaua'i Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhāʻulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhāʻulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhāʻulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top

of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Poʻipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kauaʻi community.

AIR QUALITY: As a part of the Environmental Impact Statement (EIS), existing air quality conditions and project impacts were evaluated, including dust and odor. Potential odors and emission levels for air pollutants relevant to dairy operations were modeled, as currently there are no cows on site. EIS sections 4.19 and 4.25 provide an evaluation of air quality and odors, including a windrose depicting wind speed and direction in the area (see DEIS Section 4.1, Climate). The full air quality technical report can be found in Draft EIS Appendix I.

Clean Air Act

Under the *Clean Air Act of 1970* (CAA), amended November 1990, the U.S. Environmental Protection Agency (EPA) regulates both large and small sources of air pollutants by establishing National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. The State of Hawaiʻi has established its own *State Ambient Air Quality Standards* (SAAQS) that are as strict or, in some cases more strict than the NAAQS. State standards prohibit any visible emissions of fugitive dust from construction activities at the property line.

Emissions relevant to livestock operation include particulate matter and fugitive dust. Greenhouse gases related to dairy cows include methane (CH_4) from enteric fermentation, and both methane and nitrous oxide (N_20) emissions from manure

application. No State or Federal regulations for greenhouse gas emissions from farm operations or small businesses currently exist.

DUST

Dust will be generated as cows move along soft limestone walkways that connect the paddocks and lead to and from the milking parlor. Potential fugitive dust emission rates were estimated from published literature, where particulate matter (PM) is measurable from the "drylots" of confined dairy operations where animals walk over dirt and dried manure throughout the day.

Applying the emission rates from this available literature greatly overestimates potential emission resulting from HDF. Cows in the pastoral rotational-grazing system will be on pasture 22 hours each day and will spend two hours – in two separate milking cycles –moving to and from the barn for the 10- to 15-minute milking sessions.

Using atmospheric dispersion modeling system (AERMOD), the rates were scaled to the size of the non-pasture areas used by cows at HDF. Results were added to the background concentration of particulate matter (both PM_{10} and $PM_{2.5}$) measured on the island of Kaua'i, and the total concentration was compared to the State ambient air quality standards. Only the contemplated herd size of up to 2,000 mature dairy cows was modeled, as at the lower threshold of 699 cows, the potential fugitive dust impact would be negligible. The estimated concentration for PM_{10} is 2.01 $\mu g/m^3$, well below the State standard of 150 $\mu g/m^3$. The estimated concentration for $PM_{2.5}$ is 0.23 $\mu g/m^3$, well below the Federal standard of 35 $\mu g/m^3$ (see Draft EIS Section 4.19 and Table 4-19.2).

ODOR

Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF, so air dispersion models were used to determine potential odor levels. Local weather data was used in conjunction with the AERMOD modeling system, and published rates for manure odors emissions for dairy heifers and effluent ponds were adapted to reflect the HDF facilities.

Odor emission sources identified for modeling at HDF were manure in the pasture fields, irrigation water containing diluted nutrients from effluent, the effluent storage ponds, and the dairy buildings. Odor rates from published research were applied. Odor isopleths (a line used to map all points having the same numerical value) were created to display the model findings. Odor is described in "odor units" at the threshold of perception, which is defined by the point at which 50 percent of panelists, in laboratory conditions, cannot smell the odor but 50 percent of the panelists can detect the odor.

Modeling results were generated for worst case meteorological conditions (low wind velocity / mixing). Generally, tradewinds will disperse odors to less than detectable levels beyond the HDF site; in periods of no wind, odor may not be

dispersed creating the "worst case" scenario. In these periods without normal tradewind flow, the odor plume would extend to the south of the HDF site. Sections 4.19.2 and 4.25.2 of the EIS include graphics of the potential odor isopleths.

Results for the committed herd size of 699 mature dairy cows show that odors may be detectable by 50 percent of the sensitive population once per 200 hours, or 44 hours per year, within an area that extends approximately 1,670-feet (within one-third of a mile) beyond the dairy farm boundary, and does not reach recreational or residential areas. Results for the contemplated expanded herd size of up to 2,000 mature dairy cows show odors would not extend beyond 2,780 feet outside the HDF boundary (just over half a mile), again not reaching recreational or residential areas, and again with detection limited to 50 percent of the sensitive population approximately 44 hours per year. The parameters used in the analysis were intentionally conservative, and the impacts shown assume an unlikely confluence of worst-case meteorological data, irrigation location, and grazing location. Actual offsite odor impacts are likely to be much lower and/or less frequent than shown; it is likely odor detection beyond the HDF boundaries will be less frequent.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

From: Suzanne Kashiwaeda <keola@hawaiiantel.net>
Sent: Sunday, February 22, 2015 11:18 AM
To: HDF
Subject: HDF EISPN

Group 70 International, Inc.
Attn: HDF Project
925 Bethel St. 5th Floor
Honolulu, HI 96813

Subject: HI Dairy Farms EIS Preparation Notice
Comments & Request to be a Consulted Party

Please allow me to introduce myself. My name is Suzanne Kashiwaeda and I am a retired social worker, single mother and still primary caregiver of an adult son with developmental disabilities. During my career as a social worker, I've worked with elderly individuals and groups, children with disabilities and their families, "at-risk" students, and families living in poverty conditions including homeless working families.

If you've ever had to provide 24/7 care to a person, you'd understand the critical need for respite to get away from the physical and emotional responsibilities, to recharge and renew your energy and spirit to continue to care for loved ones. Mahaulepu is a place many of us go for solitude, solace and spiritual renewal.

Taking a holistic and longterm perspective, my concerns are many:

- An industrialized dairy operation of 2000 cows would alter the quiet, peaceful and pleasant ambience of Mahaulepu and families and caregivers would lose this natural source for rejuvenation
- Runoff and pollution of nearby wells, aquifer, ocean and impact on reefs, coral, fish, other marine life can seriously and negatively impact both natural and economic resources.
- We are an island community and the time-honored Hawaiian concept of ahupua`a need to be seriously considered
- Lava tubes can carry pollutants to the ocean. Can and will they be contributing to the pollution of Waikomo Stream and its ocean mouth? If Waikomo is polluted now, how much more will it be when millions of gallons of water are used a day as part of the operation of a 2000 cow dairy?
- If HDF follows in the footsteps of other Kauai dairies and ceases operations, what are plans for restoration of the land, pollution of ocean and health of reefs? Do roads, buildings and other infrastructure remain?
- There's a significant difference between industrialized agriculture and compatible and sustainable farming. Has a smaller dairy operation been considered? What monitoring criteria can be adhered to that would provide an indication of more appropriate carrying capacity and dairy size that does not negatively impact the land, ocean, and air quality.
- Aren't there any other farming options for this land that would be more compatible with this area?
- Aren't there any other more appropriate properties for an industrial sized dairy?

I understand from the meeting Group 70 held this past Thursday that individuals submitting comments will be 'consulted parties' and will receive notices, updated and pertinent information about this project. I look forward to learning more and trust that the EIS process will be thorough and objective.

Sincerely,
Suzanne Kashiwaeda
PO Box 862
Kalaheo, HI 96741
808-332-8406

GROUP 70 INTERNATIONAL

May 26, 2016

Suzanne Kashiwaeda
PO Box 862
Kalaheo, HI 96741
keola@hawaiiantel.net

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Suzanne Kashiwaeda:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

DAIRY OPERATIONS: Hawai'i Dairy Farms (HDF) will establish and operate a sustainable, pastoral rotational-grazing dairy farm in Māhā'ulepū Valley on the island of Kaua'i to produce fresh, locally available nutritious milk for Hawai'i families. The rotational-grazing method utilizes 100 percent of the cows' manure as natural fertilizer to grow pasture grass as a primary source of nutrition for dairy cows. This cost-effective method will reduce reliance on imported fertilizer and feed. Pasture grass will comprise at least 70 percent of the animals' diet. As a part of the Draft Environmental Impact Statement (EIS), the proposed facilities and operations for the dairy farm are described in Chapter 3.

The Environmental Impact Statement (EIS) Preparation Notice (EISPN), published January 23, 2015, described the proposed pasture-based rotational grazing system

as a "zero-discharge, grass-fed dairy". The term "zero-discharge" under the U.S. Environmental Protection Agency related to concentrated feeding operations (CAFO) is a system designed to not discharge pollutants into waters of the United States. As noted previously, the HDF system is designed to utilize 100 percent of the cows' manure on-site. However, nutrients would be introduced to the HDF site with any use; the Draft EIS identifies the amount of nutrients anticipated from the proposed dairy operations that could pass through to ground and surface waters. Therefore, HDF elected to discontinue use of the term "zero discharge" as it was construed as no nutrients into the system.

The term "grass-fed" was used in the HDF EISPN. This term was used to identify HDF's intent to utilize a locally-produced feedstock – grass – for more than 70 percent of the dairy herds' diet. In January 2016, the U.S. Department of Agricultural (USDA) Marketing Survey created a narrow legal definition of "grass-fed". The USDA standard defines what animals can and cannot be fed. The Food Alliance, a project of several northwest colleges, believes that when consumers choose grass-fed products there is an expectation that these will come from animals raised on pasture on a forage-based diet. Due to the evolving definition of "grass-fed", the term in not used in this EIS.

The dairy facilities will occupy an area of approximately 10 acres on the western boundary of the site. The developed area "footprint" will be less than 2 percent of the total farm area. Four buildings will be constructed to serve different functions, supported by utilities and infrastructure. Additional building information can be found in Draft EIS Section 3.3.1.

Agricultural infrastructure and utilities required for the dairy operations will include storage tanks and silos, effluent storage ponds, livestock water systems, and drainage improvements. The irrigation system and distribution of livestock water are discussed in Draft EIS Section 3.5, Pasture Management.

The pastoral rotational-grazing dairy provides a local feedstock – grass – as the herd's primary food source. Reducing imported feed stabilizes costs and provides a food source closer to the natural diet of cows. Results of grass trials initially conducted at five sites across four Hawaiian Islands were instrumental in identifying appropriate varieties of grass, and suitable sites to support sufficient "dry matter" grass yields essential to a cow's diet. Additional project-specific trials at the Māhāʻulepū site on Kauai have been conducted for more than 18 months. The results have identified sufficient yield and nutrition to supply 70 percent of the cows' diet; improvements in grass productivity are anticipated to provide up to 85 percent of cows' diet.

The pasture-based model allows cows to move about freely, and to lie down and rest, which is part of the digestion cycle. The animals are managed in social groups known as "mobs", mimicking the natural social order of bovines. Cows spend 22 hours of each 24-hour period foraging on pasture or resting, outdoors in natural light and fresh air. The gently sloped paddocks, walkways and races minimize the energy expended by the mature dairy cows as they graze or are transferred to and from the various paddocks and the mature dairy facility; surfaces of the walkways

and cow races are designed to provide a comfortable path under hoof. The management practices and pasture model applied by HDF maximizes grass as the cows' primary nutrition source and minimizes stress to the animals. Cows tend to be healthier and live longer, productive lives with access to fresh air, high quality feed, and exercise while they forage.

The 470 acres of pasture will be divided into paddocks averaging 3 to 5 acres in size. Smaller paddocks located near the dairy facility will be used as temporary pasture for cows or calves being moved on or off the farm. To protect the water quality of surface water and downstream areas, paddock fences are set back 35 feet from the edge of drainage ways throughout the site. Existing vegetation within the setbacks will be managed or restored to reduce erosion, improve stability of ditch banks, increase net carbon storage, and improve and maintain water quality.

The majority of the pastures will be irrigated with non-potable water and/or diluted effluent through either the pivot irrigation systems or through gun irrigators. Irrigation water supply is provided to the farm from Waita Reservoir, and will be filtered and pumped to the various irrigation components on the farm. The irrigation system is controlled using computer software and GPS receivers to allow very precise application of irrigation and/or diluted effluent on the pasture. The pivots can rotate and apply irrigation water and/or diluted effluent at different rates depending on the actual irrigation needs of the farm.

NRCS provides technical guidance on applying agricultural waste depending on the desired use of the waste. Reflected in the title of the livestock waste guidance for Hawaiʻi is the parenthetical inclusion of the word "nutrients." Where waste is utilized as a resource, it is being used for the constituent components that provide benefit.

The NRCS Conservation Practice Standard 590, Nutrient Management, applies to commercial fertilizers, organic by-products, waste water, organic matter, and irrigation water. Nutrient management is the practice of managing the amount, rate, source, method of application, and timing of plant nutrients and soil amendments. The timing and application of nutrients will correspond with plant uptake, soil properties and weather conditions. For more information on nutrient balance management see Draft EIS Section 3.5.3, and Draft EIS Appendix D.

The effluent storage ponds are sized to accommodate 30 days of storage for up to 2,000 mature dairy cows, and over 85 days of storage for 699 mature dairy cows. It will be highly unlikely that the storage pond will be full at any time for the contemplated 2,000-cow dairy, and nearly impossible for the committed 699-cow dairy. Throughout the less than 30-day storage period, effluent is planned for application every four days, and the slurry application is expected at least once every 45 days, to ensure that the ponds are kept at manageable levels.

Cows lactate milk following the birth of calves. Newborn calves will be housed on the Māhāʻulepū site and provided essential colostrum and nutrients for a healthy start. During the calves' initial 90 days, they will be transitioned to pasture at HDF before transfer to ranches on Kauaʻi to be raised off-site. The committed herd size of

699 mature dairy cows at the Māhāʻulepū site applies to mature mature dairy cows. Animals in various stages of lactation and rest will be transferred between HDF and other partner ranches as needed for animal health and dairy productivity. This will benefit both the dairy and infuse the beef market in Hawaiʻi with a new, local source of pasture-raised calves. Male calves will become part of the beef cattle herd; heifers (young female calves that haven't given birth) will be raised until ready to return to the HDF herd as a birthing/mature dairy cow. For more information on off-site herd management, refer to Section 3.7 of the Draft EIS.

Health of the herd is of primary importance as the success of a dairy relies on cows effectively producing quality milk. All cows will be treated with a high standard of care. Dairy managers and caretakers will be trained and competent in handling animals to minimize stress and ensure the herds' welfare. A licensed veterinarian may prescribe use of antibiotics approved by the Food & Drug Administration (FDA) for treatment of illnesses. Adherence to guidelines that prohibit milk from cows undergoing antibiotic treatment will ensure no adulteration of milk. Routine laboratory tests of milk for traces of antibiotic residue will be conducted. HDF will not inject cows with bovine growth hormone, referred to as rBST or rBGH.

ARCHAEOLOGICAL AND CULTURAL: The Hawaiʻi Dairy Farms (HDF) project is subject to a historic preservation review by the State Department of Land and Natural Resources, State Historic Preservation Division (SHPD) under HRS Chapter 6E and Chapter 13-284. An Archaeological Inventory Survey (AIS) and a Cultural Impact Assessment (CIA) were conducted by Scientific Consultant Services (SCS) for the proposed project. EIS Sections 4.7 and 4.8 provide an evaluation of archaeology and cultural resources, with technical studies in Appendix G and H.

A total of sixteen historic properties were identified through a pedestrian survey of the project area and an extended survey area of 100 meters of the northern boundary. Six historic-era sites occur in the project area and 10 sites occur in the extended survey area. Only one of the sites is believed to be associated with pre-Contact and/or early historic times. State Site 50-30-10-2250, the agricultural heiau, and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area. The remaining sites consist of historic-era bridges, ditches, culverts, retaining walls, and a flume system dating from the 20th century and are affiliated with sugarcane cultivation.

That a majority of the documented sites are related to the historic-era is not surprising, given the massive landscape modifications that occurred during intensive sugarcane cultivation on the valley floor. Even historic era cultural materials associated with the many Land Commission Awards in the project area were non-existent, as explored through survey and subsurface exploration.

The sixteen historic properties have been assessed for significance by the archaeological consultant and the dairy project is anticipated to have no impact on these sites. No further archaeological work is recommended for the sites. Two of the sixteen sites are considered significant under multiple criteria, but occur outside the project area on lands owned by a different landowner. Both sites will not be adversely affected by the proposed dairy project. No site is related to burials, and no bonex

were found. Such sites have been reported along coastal areas in sand dunes.

The cultural assessment examined the potential effect of the project on cultural resources, practices or beliefs, its potential to isolate cultural resources, practices or beliefs from their setting, and the potential of the project to introduce elements which may alter the setting in which cultural practices take place. Information received from the community indicates the Māhāʻulepū Ahupuaʻa, has been and is currently used for traditional cultural purposes. However, the dairy project area has not been included in these activities. It is clear that the gathered plants, trails, State Site 50-30-10-2250, the agricultural heiau, and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area.

The project will be fully enclosed by perimeter fencing along the boundary of the leased premises, which will ensure that project activities and any related impacts are contained within the project area. Based on the research and comments received from the community, it is reasonable to conclude that, pursuant to Act 50, the exercise of native Hawaiian rights or any ethnic group related to numerous traditional cultural practices will not be impacted by establishment of the dairy.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawaiʻi Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

From:	Dawn Kawahara
To:	epo@doh.hawaii.gov
Cc:	HDF
Subject:	EIS Prep. Notice deadlining today, Feb. 23, 2015
Date:	Monday, February 23, 2015 12:00:25 PM
Importance:	High

To: Hawaii St. Dept. of Health, Environmental Planning Office
919 Ala Moana Blvd., Rm. 312
Honolulu, HI 96814

COMMENTS re EIS on Hawaii Dairy Farms proposed for Mahaulepu, Kauai

To Whom It May Concern:

Please tell me that this is not a "done deal." Damage to nature cannot be healed in one's lifetime. There is so much conflict of interest involved in this process, I can't believe fairness can be achieved.

I think the "Head" of the Health Dept. should visit this area before making this decision.

Sincerely,
Delano

Delano H. Kawahara
Concerned retired biology teacher – Kapaa High School, Kapaa, Kauai

5753 Noni St., Kapaa, HI 96746-9659
(808) 822-3271

GROUP 70 INTERNATIONAL

May 26, 2016

Delano H. Kawahara
5753 Noni St.
Kapaa, HI 96746-9659
Dawn Kawahara <deedawn@earthlink.net>

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Delano H. Kawahara:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

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The dairy facilities will occupy an area of approximately 10 acres on the western boundary of the site. The developed area "footprint" will be less than 2 percent of the total farm area. Four buildings will be constructed to serve different functions, supported by utilities and infrastructure. Additional building information can be found in Draft EIS Section 3.3.1.

Agricultural infrastructure and utilities required for the dairy operations will include storage tanks and silos, effluent storage ponds, livestock water systems, and drainage improvements. The irrigation system and distribution of livestock water are discussed in Draft EIS Section 3.5, Pasture Management.

The pastoral rotational-grazing dairy provides a local feedstock – grass – as the herd's primary food source. Reducing imported feed stabilizes costs and provides a food source closer to the natural diet of cows. Results of grass trials initially conducted at five sites across four Hawaiian Islands were instrumental in identifying appropriate varieties of grass, and suitable sites to support sufficient "dry matter" grass yields essential to a cow's diet. Additional project-specific trials at the Māhāʻulepū site on Kauai have been conducted for more than 18 months. The results have identified sufficient yield and nutrition to supply 70 percent of the cows' diet; improvements in grass productivity are anticipated to provide up to 85 percent of cows' diet.

The pasture-based model allows cows to move about freely, and to lie down and rest, which is part of the digestion cycle. The animals are managed in social groups known as "mobs", mimicking the natural social order of bovines. Cows spend 22 hours of each 24-hour period foraging on pasture or resting, outdoors in natural light and fresh air. The gently sloped paddocks, walkways and races minimize the energy expended by the mature dairy cows as they graze or are transferred to and from the various paddocks and the mature dairy facility; surfaces of the walkways

and cow races are designed to provide a comfortable path under hoof. The management practices and pasture model applied by HDF maximizes grass as the cows' primary nutrition source and minimizes stress to the animals. Cows tend to be healthier and live longer, productive lives with access to fresh air, high quality feed, and exercise while they forage.

The 470 acres of pasture will be divided into paddocks averaging 3 to 5 acres in size. Smaller paddocks located near the dairy facility will be used as temporary pasture for cows or calves being moved on or off the farm. To protect the water quality of surface water and downstream areas, paddock fences are set back 35 feet from the edge of drainage ways throughout the site. Existing vegetation within the setbacks will be managed or restored to reduce erosion, improve stability of ditch banks, increase net carbon storage, and improve and maintain water quality.

The majority of the pastures will be irrigated with non-potable water and/or diluted effluent through either the pivot irrigation systems or through gun irrigators. Irrigation water supply is provided to the farm from Waita Reservoir, and will be filtered and pumped to the various irrigation components on the farm. The irrigation system is controlled using computer software and GPS receivers to allow very precise application of irrigation and/or diluted effluent on the pasture. The pivots can rotate and apply irrigation water and/or diluted effluent at different rates depending on the actual irrigation needs of the farm.

NRCS provides technical guidance on applying agricultural waste depending on the desired use of the waste. Reflected in the title of the livestock waste guidance for Hawaiʻi is the parenthetical inclusion of the word "nutrients." Where waste is utilized as a resource, it is being used for the constituent components that provide benefit.

The NRCS Conservation Practice Standard 590, Nutrient Management, applies to commercial fertilizers, organic by-products, waste water, organic matter, and irrigation water. Nutrient management is the practice of managing the amount, rate, source, method of application, and timing of plant nutrients and soil amendments. The timing and application of nutrients will correspond with plant uptake, soil properties and weather conditions. For more information on nutrient balance management see Draft EIS Section 3.5.3, and Draft EIS Appendix D.

The effluent storage ponds are sized to accommodate 30 days of storage for up to 2,000 mature dairy cows, and over 85 days of storage for 699 mature dairy cows. It will be highly unlikely that the storage pond will be full at any time for the contemplated 2,000-cow dairy, and nearly impossible for the committed 699-cow dairy. Throughout the less than 30-day storage period, effluent is planned for application every four days, and the slurry application is expected at least once every 45 days, to ensure that the ponds are kept at manageable levels.

Cows lactate milk following the birth of calves. Newborn calves will be housed on the Māhāʻulepū site and provided essential colostrum and nutrients for a healthy start. During the calves' initial 90 days, they will be transitioned to pasture at HDF before transfer to ranches on Kauaʻi to be raised off-site. The committed herd size of

699 mature dairy cows at the Māhāʻulepū site applies to mature mature dairy cows. Animals in various stages of lactation and rest will be transferred between HDF and other partner ranches as needed for animal health and dairy productivity. This will benefit both the dairy and infuse the beef market in Hawaiʻi with a new, local source of pasture-raised calves. Male calves will become part of the beef cattle herd; heifers (young female calves that haven't given birth) will be raised until ready to return to the HDF herd as a birthing/mature dairy cow. For more information on off-site herd management, refer to Section 3.7 of the Draft EIS.

Health of the herd is of primary importance as the success of a dairy relies on cows effectively producing quality milk. All cows will be treated with a high standard of care. Dairy managers and caretakers will be trained and competent in handling animals to minimize stress and ensure the herds' welfare. A licensed veterinarian may prescribe use of antibiotics approved by the Food & Drug Administration (FDA) for treatment of illnesses. Adherence to guidelines that prohibit milk from cows undergoing antibiotic treatment will ensure no adulteration of milk. Routine laboratory tests of milk for traces of antibiotic residue will be conducted. HDF will not inject cows with bovine growth hormone, referred to as rBST or rBGH.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawaiʻi Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

From: Dawn Kawahara
To: epo@doh.hawaii.gov
Cc: HDF
Subject: COMMENT re Hawaii Dairy Farms EIS Prep Notice
Date: Sunday, February 22, 2015 11:22:02 PM
Importance: High

To: Hawaii State Dept. of Health, Environmental Planning Office
919 Ala Moana Blvd., Rm. 312
Honolulu, HI 96814

To Whom it May Concern:

I have read through all regarding the proposed industrial dairy now under consideration for the Mahaulepu area of Kauai, my home island. Also, I attended the public meeting held at Koloa School's cafeteria on Thurs., Feb. 19, 2015, and visited all four corners of the Dairy Farms' displays, listening, looking, and reviewing questions over the din/hubbub (hard to hear).

My comment is that I am dead set against the use of this sensitive, beautiful and culturally significant piece of agricultural land adjacent to ocean and reef for the purpose as described. The bottom line as I see it is this: What is this dairy operation going to contribute to the Kauai community?

The milk is to be trucked/shipped off island; no milk, butter, cheese or yogurt is coming to us as a local product.

The next related question is: What is this dairy operation going to gain while taking and possibly ruining a highly prized part of our island?

I am sure the answer is in dollars, several figures. For the dairy as an agricultural corporate entity, and the CEOs and backer. And for Grove Farm Corp., the entity leasing the land.

Any fool can see that this equation doesn't pan out: Kauai residents (not to mention visitors) gain nothing of value while allowing possible/probably ruination of land, sea and reef, and air quality. As in New Zealand, and recently in Minnesota and California, if an industrial dairy swings into operation on island, it's a given that sometime soon environmental protection laws will need to be passed to prevent illness and contamination —and aid in the healing and recovery of the people, land and water if possible. It will be slow process, since it's much easier to foul a place than return it to its earlier state.

It's too great a risk to take.

Yet, in keeping the land in agriculture, as set forth in our zoning, it is highly possible to entertain thoughts of an ulu tree plantation, with hemp to begin a new fiber industry on island, and possibly free-range chickens naturally fertilizing within such farmlands. Foods of value, and fiber of value would be gained by Kauai residents with crops and poultry farming of this sort, which should be encouraged.

I say NO very definitely to the dairy proposal. I believe much of what has been presented to the public here by the dairy representatives is half-truth, or possibly more of a lie than truth.

Sincerely,
DAWN

Dawn Fraser Kawahara
5753 Noni St., Kapaa, HI 96746-9659
(808) 822-3271

GROUP 70
INTERNATIONAL

May 26, 2016

Dawn Fraser Kawahara
5753 Noni St.
Kapaa, HI 96746-9659
deedawn@earthlink.net

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Dawn Fraser Kawahara:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

LAND USE: The historical and existing land uses of the project site and surrounding Māhā'ulepū Valley were examined in the Draft Environmental Impact Statement (EIS), and uses proposed by the Hawai'i Dairy Farms (HDF) project were evaluated in the context of county and state land use designations for the area. The evaluation of land use is presented in Draft EIS Chapter 4.4, and the project's consistency with government plans and policies is presented in Draft EIS Chapter 5.0.

The south shore of Kaua'i is home to some of the most productive farm land in the state, attributed to consistent sunshine, ample fresh water, and a large amount of Class A and B soils (with "A" representing the class of highest productivity soils and "E" representing the lowest). The large tracts of farmland, including those of Mahaulepu Farm and Grove Farm, allow for stability in support of farm ventures,

help maintain regional water systems and provide agricultural employment for Kaua'i residents in addition to fresh, local food.

The project site is on agricultural land in Māhā'ulepū Valley, an area with a long history of agricultural use as it was the first place in the island chain where sugarcane was commercially grown. The site is in the Agricultural District per State Land Use District designations, and per the County of Kaua'i zoning ordinance. The site consists of land classified as Prime per the State Department of Agriculture's Agricultural Lands of Importance to the State of Hawai'i (ALISH). The HDF site is outside of the County-designated Special Management Area under the Coastal Zone Management Program.

In 2005, the State established Important Agricultural Lands (IAL) by statute. The purpose of IAL is to conserve and protect agricultural lands, promote diversified agriculture, increase agricultural self-sufficiency and assure the availability of agriculturally suitable lands. The designation process determines land meet physical requirements including contiguous, functional land units large enough to allow flexibility in agricultural production near appropriate infrastructure and water, with high quality soil agricultural productivity ratings under the Land Study Bureau of University of Hawai'i.

In 2011, Mahaulepu Farm LLC filed a petition with the State of Hawai'i Land Use Commission to designate 1,533 acres of agricultural lands in Māhā'ulepū (including 557 acres that make up the HDF site) as IAL. IAL designation meets the objectives of the State HRS §205-42 by contributing to the maintenance of a strategic agricultural land resource base to support a diversity of agricultural activities and opportunities that expand agricultural income and job opportunities. See Figure 4.4-2 in DEIS Section 4.4.

The designation process determined that the land meets a number of physical requirements established in HRS §205-45, including contiguous, functional land units large enough to allow flexibility in agricultural production near appropriate infrastructure and water, with 88.5 percent of the area featuring an overall soil agricultural productivity rating of "B" per criteria established by the Land Study Bureau of University of Hawai'i.

The development and long-term operation of HDF will be in full compliance with its agricultural State Land Use District designation, ALISH classifications, and County zoning. The dairy farm will embody the intent of the IAL designation per the Hawai'i State Constitution, by using these protected lands for the intended purpose of diversified agriculture, food production and agricultural self-sufficiency. HDF development of a dairy also supports the "secondary intent" for lands in the Agriculture land designation, to provide an opportunity for Kaua'i citizens to reside in an agricultural community. This is in contrast to the described "agricultural subdivisions" that have changed parts of Kaua'i intended for a rural landscape, with development as quasi-suburban landscapes dotted with residences on large lots.

Overall, the project provides long-term benefit and support of agricultural lands and industry through continued use in keeping with zoning and IAL designation. Long-

term operation of the dairy does not preclude the region for future protection in a coastal park at Māhā'ulepū.

DEMOGRAPHIC AND ECONOMIC: The potential impacts of Hawai'i Dairy Farms (HDF) to the existing economy were evaluated in the Draft Environmental Impact Statement (EIS), including a fiscal impact assessment report completed in April, 2016 by Plasch Economics Pacific. Draft EIS Section 4.15 addresses demographic and economic factors, with the complete report in Appendix J.

The HDF project would create short-term benefits through jobs for local construction personnel and local material suppliers. Such jobs would include equipment operators, cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, supervisors, painters, etc. Based on State employment multipliers, indirect employment related to Dairy construction would be expected to average about 16 jobs on Kaua'i, and 8 on O'ahu. Construction employment would be expected to average about 12 jobs per year during the development period. Thus direct-plus-indirect employment association with construction would be expected to average approximately 36 jobs, of which 28 would be on Kaua'i.

The HDF project would contribute to diversification of Kaua'i's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Hawai'i Island), approximately10 percent of Hawai'i's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and indirect full-time equivalent jobs on Kaua'i, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on O'ahu.

HDF is expected to generate a net income of approximately $68,000 to the County when the 699 cow herd is established. When the dairy has matured to full production for the 699 cow dairy, net income to the State is calculated at $160,000 annually. With the potential contemplated herd size of up to 2,000 mature dairy cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be produced. This would double local milk production currently supplied by operational dairies on the Island of Hawai'i.

Additional employment generated by a possible expansion to accommodate the contemplated 2,000 mature dairy cow herd is estimated at approximately 3 construction jobs plus 4 indirect jobs on Kaua'i, and 2 indirect jobs on O'ahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an additional 5 full-time farm jobs would be added, with approximately 15 additional indirect jobs on Kaua'i and another 8 indirect jobs on O'ahu.

The dairy is expected to generate a net additional contribution to the County of approximately $8,000 for improvements related to expansion for the contemplated herd size of up to 2,000 mature dairy cows ($76,000 total versus $68,000 for the

committed herd size). The State will derive approximately $360,000 annually in revenues from the contemplated 2,000-mature dairy cow dairy.

Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

ALTERNATIVES: As a part of the DEIS, alternatives were evaluated that could attain the objectives of the action's purpose and need, and were compared with environmental benefits, costs, and risks of each reasonable alternative against those of the proposed dairy project. Further discussion of alternatives can be found in DEIS Section 6.

The DEIS evaluates alternatives that could attain the objectives of the action's purpose and need, and compares environmental benefits, costs, and risks of each reasonable alternative against those of the proposed action. Additionally, reasonable land use alternatives that emerged from public input during the project scoping phase are documented and briefly discussed. The alternatives that do not meet the project purpose are not advanced for analysis of environmental benefits, costs, and risks. The Environmental Impact Statement Rules, Hawai'i Administrative Rules Chapter 11-200 (HRS 11-200) requires a discussion of alternatives that could attain the objectives of the action, regardless of cost. There is no requirement for the alternatives analysis to consider every possible land use.

Four possible land uses that would not meet the project purpose are discussed. Rezoning the land for resort or residential development, or a potential conservation condemnation are two uses that were examined and eliminated from analysis. These options would not be reasonably viable given the existing private land tenure and existing zoning. Two additional alternatives were considered as reasonable land uses as they could be permitted within the existing State Land Use Agricultural District and County Agricultural Zoning District. These options include Agricultural Park with Processing Center, and development of an Agricultural Subdivision. The alternatives were examined and eliminated from further analysis, however, as they would not fulfill the project purpose.

The analysis, therefore, focuses on alternatives that meet the project purpose. Rigorous exploration and evaluation of the environmental impacts of the alternatives, including those that might enhance environmental quality or avoid, reduce or minimize some or all of the adverse environmental effects, costs and risks. These alternatives include: (1) the development of a Conventional Feedlot Dairy (a non-pasture-based dairy) at the same location; (2) development of the Pasture-Based Dairy at an Alternative Location on Kaua'i; and (3) milk products processing by HDF. The alternative of "No Action" is also evaluated.

The alternatives analysis provides a comprehensive evaluation of the range of potential alternatives, including the two alternative development scenarios.

Although the alternatives are potentially reasonable uses under existing zoning and neighboring uses, each fails to comprehensively fulfill the project requirements defined by the eight Project Objectives and the four established Evaluation Criteria (Chapter 2, Sections 2.3.3 and 2.3.4).

The essential differences as compared to the proposed action are highlighted in the following statements.

- Only one of the alternative actions (conventional feedlot alternative) would create a commercial scale dairy operation in Hawai'i, with the capability to produce 10 percent of the State's fresh milk demand thus reducing dependence on imported milk (Objective 1). This alternative, however, would not reduce reliance on costly imported fertilizer and feed (Objective 2); grow local, quality grass as a primary feedstock (Objective 3); and would not utilize 100 percent of manure on site as nutrients to grow forage for dairy cows (Criterion 4).
- None of the alternatives would secure a dairy location that meets the requirements for a pastoral, pasture-based grazing dairy: sufficient contiguous land area; available long-term land tenure; adequate potable water supply; suitable soil properties; gentle slope conditions; and accessibility (Criterion 1).
- One alternative (Agricultural Park) could potentially generate new long-term employment in the agricultural sector on Kaua'i in a wide range of positions including pasture agronomy/soils science, environmental resources management (Criterion 2).
- The Agricultural Park alternative could also develop sustainable food production utilizing Important Agricultural Lands, demonstrating the importance of long-term agricultural leases and capital investment for agricultural infrastructure, water systems and support facilities. (Criterion 3). However, after years of trying, it appears there was limited interest in such a venture.
- Finally, addressing the range of potential environmental impacts (natural, cultural, social and economic) (Objective 8) the two alternative development scenarios would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.

In contrast to the other options considered, the planned agricultural operation of Hawai'i Dairy Farms, was determined to be the most viable option and is the preferred alternative. Of all the alternatives considered, this is the only approach that achieves project objectives and meets each of the four Evaluation Criteria.

- Hawai'i Dairy Farms will create a commercial scale pasture-based dairy operation in Hawai'i, with the capability to provide more than 1,000,000 gallons of the fresh milk demand, reducing dependence on imported milk (Objective 1).
- The planned dairy location meets the requirements of minimum land area, soil properties, slope conditions, water supply, land tenure and availability, and accessibility (Criterion 1).

- The planned action will generate new long-term employment in the agricultural sector on Kaua'i, including pasture agronomy/soils science, veterinary and animal husbandry, environmental resources management, milk/milk processing, and dairy business management (Criterion 2).
- Sustainable food production utilizing Important Agricultural Lands (Criterion 3) will occur with the proposed action, demonstrating the importance of long term agricultural leases, and the ability to draw capital investment for agricultural infrastructure including water systems and support facilities (Criterion 3).
- Address the range of potential environmental impacts by utilizing 100 percent of manure as natural fertilizer to grow the majority of food for cows (Criterion 4). The alternatives evaluated would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.
- Creating an economically viable pasture rotational-grazing model maintains agriculture, retains open space, and provides buffer between highly utilized resort and residential development and sensitive natural or cultural resources (Objective 8).

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

Lani Kawahara
PO Box 1565
Kapaa, HI 96746

RECEIVED
FEB 25 2015
GROUP 70 INTL

February 23, 2015

State of Hawai'i, Department of Health
1250 Punchbowl Street
Honolulu, HI 96813
ATTN: Laura McIntyre

Jeff Overton
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, HI 96813

Hawai'i Dairy Farms, LLC.
P.O. Box 1690
Kōloa, HI 96756-1690

To Whom It May Concern:

I have serious concerns about the building and operation of an industrial dairy on our south shore, in the delicate ecosystem of Mahaulepu.

Building and operating this dairy involves an **irrevocable commitment** to loss or destruction of our limited and unique ecosystems.

In particular, there is a real and proven concern that the proposed dairy will affect or is likely to the damage the south shore's environmentally sensitive areas such as flood plains, beach, erosion-prone areas, geologically hazardous land, estuary, fresh water and coastal waters.

The proposed dairy would also contaminate groundwater, detrimentally impacting the environment and public health. Large dairies in the United States have been found responsible for contamination of groundwater. Groundwater contamination is especially concerning for this project, as the aquifer in the area provides potable drinking water for the County of Kaua'i Department of Water Supply.

Please honestly and straight-forwardly address these concerns and many other concerns that are being raised by residents, aquatic biologists, environmental scientists and health professionals.

Sincerely,

Lani Kawahara

May 26, 2016

Lani Kawahara
P.O. Box 1565
Kapaa, HI 96746

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Lani Kawahara:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths –

as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhā'ulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhā'ulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Po'ipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhā'ulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawai'i Department of Health Milk Rules require that potable water be used for milk production, both in the milking parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhā'ulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhā'ulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of

groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhāʻulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kauaʻi community.

Regional Water Demand: The adjacent, developed Kōloa-Poʻipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kauaʻi will increase county-wide by 17,300 residents by 2030. The South Kauaʻi population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kauaʻi region (the Kōloa - Poʻipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhāʻulepū Surface Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhāʻulepū watershed.

The HDF site is located on the bottom-land of the upper Māhāʻulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Haʻupu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhāʻulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built

facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kauaʻi Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhāʻulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhāʻulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhāʻulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to

create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Poʻipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the

Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kauaʻi community.

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawaiʻi Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

February 21,2015

RECEIVED

FEB 23 2015

GROUP 70 INTL

State of Hawaii – Department of Health
Laura McIntyre, Environmental Planning Office
919 Ala Moana Blvd., Room 312
Honolulu, HI 96814

Re: Hawaii Dairy Farms, Kauai

Comments to be considered in preparation of an Environmental Impact statement for:
Project Name: Hawai'i Dairy Farms
Island: Kaua'i
District: Poipu
TMK: (4) 2-9-003:001 (portion); 006 (portion)
(4) 2-9-001:001 (portion)

Aloha Ms. McIntyre:
After carefully reviewing the plan for the Hawaii Dairy Farm (HDF) provided to the public for comments to be considered in drafting the Environmental Impact Statement I would assert that HDF has caused serious environmental impacts during their grubbing and grading process prior to the arrival of cows and that upon arrival of the cows the impacts would be significant. HDF will not be able to mitigate the cumulative impacts HDF will have on the environment, public health and local businesses.
First and foremost HDF must prove that there will never be discharge of pollutants from direct surface runoff or ditch discharge into Waiopili stream, and that percolation into both shallow and deep groundwater will not contaminate stream, estuarine and near shore coastal waters. It would appear there are multiple areas and weather events that could cause possible breaches. Please identify all possible areas and weather events that could cause breaches.
On the third page of the EISPN HDF uses the words "Grass-fed dairy". What are the USDA requirements for a dairy to call itself "grass-fed"? Why does HDF represent themselves to our community as being "grass-fed"? Does HDF meet the USDA standards to be called "grass-fed"?
How are the barns referred to in the EISPN going to be used?
Please define and be specific as to what "several years" to establish the herd means.
What range do the nutrient readings need to be in to determine that it is not wise to bring another cow onto the site? What percentage of the paddocks will need to be in the correct range of the nutrient analysis to bring more cows? What percentage of the paddocks need to be in the detrimental range to halt the addition of cows? How often will the nutrient analysis be done on all of the paddocks? What will HDF do with their cows if the nutrient analysis doesn't support the number of cows they have?
What about the herd's health, why isn't that being used to determine if HDF has too many cows? For the health of the cows becomes a limiting factor, what are the standards and parameters HDF will use? (number of downer cows?)
How is HDF's plan any better than the NZ Model when it comes to the degradation of the water, air, and the environment? Please incorporate into the EIS the common breaches occurring in New Zealand on properties abutting or containing waterways so we can examine them in direct comparison to the HDF plan's impact.
How does the site being in the Flood Zone X impact the environment when looking at the weather hazards (hurricanes, tropical depressions and storms, etc?)that have occurred on our small island?
If the soils are "supportive of nutritious grass types" as stated in the EISPN then why did the grass planted last spring fail to thrive?
What leads HDF to believe Grove Farms can supply them with 3 million gallons of water per day that they require to operate, when Grove Farms is not a utility company? The water belongs to the people of Hawaii under the state constitution (Public Trust Doctrine) have you asked the people if they want 3 million gallons of water per day diverted to HDF?
What will HDF do to get 3 million gallons of water per day when, as in Maui, the water is returned to its natural course?
What size bond is HDF putting up for cleanup when a natural disaster occurs? If there is no bond what is the rationale behind that when anyone that lives here knows it's a matter of when not if?
What will be done to protect the cows during flash floods, tropical storms, tsunamis and hurricanes? What will be done to protect the cows from the extreme heat (over 90 degrees and up to 104 degrees per pg. 59 of HDF waste management plan) of the valley as there are no trees for them, only Norfolk pine trees to line the entry road?
The Waipili stream originates from the HDF site via springs, ground water and, mountain runoff and goes to the ocean. It has the highest bacteria count of any stream on Kauai. The ocean has high reading in front of Gillian House where the stream is polluting the ocean. Older

readings by the Department of Health show that 2008 and 2010 readings for this area had were in acceptable range. What steps has HDF taken to keep soil from being washed into the stream during grubbing and grading? How will HDF clean up the stream before bringing cows?

What is HDF's expected total cost for all improvements? How much are the tax credits valued at for these improvements because of IAL designation of the property?

Where did you get your computations and information on the distances to populated areas? The Gillin house in much much closer as well as the Hyatt Resort and all of Poipu Kai homes and condos and Poipu Aina development of home sites and existing homes are less of a distance than Koloa town. What are the distances to the aforementioned properties from the closest corner of the HDF site not the effluent ponds? Please measure again these distances.

Please cite where you found the information that there were concerned citizens over the loss of Ag land that wanted Grove Farms site (HDF site) protected under IAL?

HDF states the quality of the land was studied during the designation process and was determined to be high quality soil? How is that? Where is this study, who did the study and what are their qualifications? Why does that statement contradict 2014 NRCS soils report? The EISPN states the most abundant soils are Kalihi and Ka'ena, brown variant, which the 2014 NRCS study states these soils have a very slow infiltration rate (high runoff potential), how can this be considered high quality soil?

If an invasive species is already on the island of Kauai, explain your thought process that more is better or alright to establish in respect to Kikuyu grass. How will the wetlands be protected from the invasive Kikuyu grass? The EISPN sights Kikuyu-guinea grasses are to be used. One is a matting grass and the other a clumping grass, how are they not going to compete with one another? Kikuyu grass is toxic to cows if they eat it down past a certain point, how is HDF going to monitor the grass so the cows are sickened? Who are your horticultural experts and what are they saying in regards to the attempts that have been made to grow Kikuyu? Where are their reports as it would appear even to a layperson that the Kikuyu is suffering from failure to thrive?

The EISPN states that DOH regulates waste management utilizing EPA's requirements. What are these requirements and how does HDF's plan meet or fall short on these requirements? The EISPN states that in September and October 2014 a waste management plan was reviewed by the DOH. Was the waste management plan approved of by DOH? If so please furnish the paperwork stating approval of the waste management plan. Doesn't the DOH refer to a dairy of 699 cows as a medium size CAFO? Isn't HDF a medium size CAFO?

Aren't the cow walkways sloped so water will runoff and not destroy the integrity of the walkway? What is the distance from the edge of the walkway to the closest edge of the reopened drainage ditches that are connected to the Waipili Stream? Will the manure and urine from the cows twice a day trek to the milking barn be cleaned up off the walkways that are sloped towards the reopened ditches? What precautions were taken during grubbing and grading to protect the ditches from soil runoff? What was done to protect the receiving waters of the Waipili Stream and ocean during the cleaning out and reopening of the ditches from soil erosion? Are the future plans for maintenance of the ditches the same as during grubbing and grading?

What will be done with the milk in the storage tank should the milks temperature reach above 45 degrees? How will this affect the ditches, the stream and the ocean? How many gallons of milk would this be if the storage tanks are completely filled?

Before HDF gets approved for their operating permit from DOH won't they need to get approval from DNLR?

Has HDF considered eliminating the settling pond and instead first removing all of the particulate from the wash down water, using a passive or automated incline screen followed by a continuous sand filter, like a Dynasand? If so why did you not explore this option as by using this process you would have a higher quality effluent to hold in the irrigation pond, making a flooding event considerably less damaging to the environment? For what reason would you not use a system that the solid waste would be dewatered at the source and easily used for composting or waste-to-energy? If this system was used with aeration of the pond then the odor would be minimized. Why would you not be a good neighbor and minimize the odor through this process? HDF talks about covering the effluent ponds when speaking with the community, why not commit?

Who is the veterinarian for the cows? How often will he be checking the entire herd for health related issues, which are multiplied by the number of cows in close proximity to each other and standing in their own and other cows' manure that is left on the ground in the paddocks?

If you chose the CAFO alternative and used the Dynasand method then less water would be needed. Why not use less water?
Why not consider using smaller multiple sites for your cows, when considering alternatives, this would be more environmentally sound?
Is it all about the money or is the environment worth spending more money to protect it?
What large land owners besides Grove Farms in the Hawaiian Islands have you contacted and taken a serious look at the feasibility of their sites? Would any of them been more protective of the environment? How many of the sites be more protective of the environment? If the sites were more protective, what was the rationale behind rejecting the sites?
Do you believe the Important Agricultural Land designation with all its tax benefits was intended to help small farmers succeed and not for large profitable corporations?
HDF states in the EISPN that initial operations are permitted to begin with up to 699 cows. Where is the operating permit? Could you make a copy available to the community?
What access will the community be allowed to the cultural sites?
How are these sites to be protected from the effects of acid rain that is produced when hydrogen sulfide produced by the cows meets with rain?
How often does the temperature in the valley exceed 86 degrees?
What are the highest of the temperatures that exceed 86 degrees?
How will the cows be protected during this extreme heat?
How many times has the rainfall exceeded 50" per annum? When was the longest and most extended rainfall event recorded on Kauai? What major events happened during this time? How would this effect soil erosion in the valley? Where will the cows go during such events? How will they be protected?
The EISPN states no known seismic activity has originated among these northern islands then why does the earthquake map from USGS, Atlas of Natural Hazards in the Hawaiian Coastal Zone show one on their map in Maha'ulepu area?
There are new flood maps, what was the date of the flood map that was cited in the EISPN?
The EISPN states that during hurricanes, operational plans for safekeeping of the dairy's livestock will be identified in the Draft EIS. What about the enormous quantity of manure on the ground, how will that be protected from leaving the dairy during a hurricane that comes with torrential rains?

The EISPN states the average annual rainfall in Maha'ulepu is 50" why is this figure so different than the 60" to 100" mean annual precipitation cited in the 2014 NRCS Soils report? The change in number of inches of rain due to climate change needs to be accounted for in the EIS draft.
How far away is Koloa drinking water well F from the proposed desludge site, block H at its closest point? What is the ability of the soil to transport water/liquids in Block H? How long would it take for the liquids from the desludge to migrate through this type of soil after a rain storm?
What are the readings from the baseline air quality test? If HDF hasn't done a current air quality study before any cows come, why not?
What are the noise readings from HDF baseline study? If HDF hasn't done a baseline study, why not?
How many decimals is the bawling of a new mother cow when separated from her calf? How many decimals higher in terms of human hearing is the bawling at night when ambient sounds disappear? Based on HDF's plan approximately 333 cows will be separated from their new born calves every two months. What is the decimal reading of 333 cows bawling after being separated from their calves? How many days on average do mother cows bawl for their calves and how many hours per day on those days? What is the EPA permissible noise level in a populated community? How does the EPA level compare to the noise level of cows bawling?
Will HDF have an air monitoring system on location? What type of system? How is it calibrated for accuracy? Who will be responsible for recording the readings and alerting the community and officials when it surpasses Hawaii's or EPA standards, will it be an unbiased person or an HDF employee? How often will the reading be reported to the community so as to alert community members with respiratory problems? What are the readings on the six pollutants for air quality established by EPA (NAAQS) that should not be exceeded? What will HDF do to resolve the problem of poor air quality if it should occur for each of the six pollutants? How will the farm workers be protected from air pollutants seeing as they would get the brunt of the pollution? What kind of health insurance will be provided for the workers?
In regards to your irrigation system. What is the dimensions of the 2 pivots circles- radius etc.? How many wheel assemblies are there and what is the tonnage load per wheel section both empty and full? How are the certain ruts treated? What is the total mileage of the

individual wheel section tracks? What are the specs re: slope climbing ability of the HDF pivot system? Where is it emptied out when transitioning between effluent spreading and irrigation use? What is the uniformity/spread certainty, error rate distance of the end gun system that HDF proposes? Rutting is a common problem with wheels/boons getting stuck. Will this create an over application of effluent? How is HDF going to deal with wheel rutting problems causing new ditches in which the water/effluent can flow into the stream?

The plan states that disludging " hydrants which have a "gun sprinkler" with a 5/8 inch nozzle attached via a length of flexible hose", does this meet code?

What is the exact amount of water usage per dairy cow per pre-milking wash down?

The plan that West Kauai Soil and Water Conservation approved in 2013 is no longer as that plan was unacceptable to DOH and a complete new plan(July 2014) has been adopted by HDF. When is HDF going to submit the new plan for approval to the West Kauai Soil and Water Conservation?

What is the depth to Water Table for the soil (KavC) pod 159 of the burial pits? Are you planning on leaving 2 feet of soil above the water table before HDF buries a cow? Are you planning on spacing the dead cows 2 feet apart horizontally? HDF's archaeologist said at the Feb 19th, 2014 meeting that the water table was at 3.5 feet deep. If you need to leave 2 feet above the water table that would only leave 18 inches. How wide are dead cows? What are your calculations on how many dead cows you can bury In your cemetery? Where is HDF going to put them after the cemetery is full? Will the cemetery seep deteriorated matter to the nearby wetland on the property next door? What steps will be taken to stop possible seepage? Should there be seepage how would this impact the endangered and water birds? How is HDF going to stop the large rain runoff from coming down the mountain and floating up the dead cows?

Where is the large depression referred to in the Kaua'I Reconnaissance Survey? What is being done to protect it?

How will the Makauwahi cave that floods every couple of years, be protected from contaminated runoff from the HDF site? This contamination would include manure, urine, fertilizers, antibiotics, hormones and phosphorous and nitrates.

How is HDF going to protect the community from being bit by the biting flies while trying to enjoy the beach? How is HDF going to protect the community at large from biting flies? Will HDF be responsible for all medical bills, pain and suffering inflicted by the biting flies as a vector for disease?

Have you studied the diseases caused by flies as a vector? Why not? Are you going to make the study available to the community at large?

What is HDF going to do to protect the wetlands and nesting environments from becoming inundated with the invasive kikuyu grass causing the endangered species loss of their forage?

What will be done to protect the waterbirds, the Newell Shearwater, the migratory birds, the indigenous species, the terrestrial Invertebrates, the marine vertebrates, the reef fish, the arthropods and the seaweed that the local people gather? Please address these individually citing their habitat needs and how those are being protected? What will be done in the event of a breach to insure that these species are not desecrated?

The social-economic impacts will be greatly significant. How much will house values drop within 5 miles of the dairy? Please denote these figures for every half mile increment. How far can flies travel? Once a fly reaches another moist area, how far will it fly from there? How many larvae does each fly lay? What is the exponential number of flies after a year of the dairy opening if we start with one fly per cow (2,000 flies)? How will this affect homes with pools value within 5 miles of the dairy? How far will the odor travel based on an average day's northeasterly or easterly wind speed of between 15-17mph? How will HDF protect the community including Keiki and Kapuna from the gases and particulate produced in the air by the dairy? What about the community members that have compromised lungs? Will HDF pay for their medical expenses if their conditions take a turn for the worst after the dairy is in? Many dairies purchase the homes that are impacted by their operations, how many will HDF purchase?

The EIS must study the impacts to the environment and study the potential impacts to the Poipu visitor economy which will be significantly impacted by the environmental consequences of such an intensive land use in the Maha'ulepu valley. How many jobs would be lost at the Hyatt because of odor and flies? Does HDF plan on remunerating the Hyatt for lost business? What about the owners at Poipu Kai and other vacation rentals loss income?

What will HDF do to address the impact of acid rain created by the off gassing of their cows?

Will HDF be paying the county to accept their solid waste? What is the county's cost per ton for their HDF? How much will HDF pay per ton?

The EISPN states that the site has a system of ditches to channel storm water through the area, as well as to drain fields. Are these the same fields where the manure and urine are left on the ground? Would this not be considered nonpoint source discharge? Wikipedia defines nonpoint source discharge as," **Nonpoint source (NPS) pollution** refers to both water and air pollution from diffuse sources. Nonpoint source water pollution affects a water body from sources such as polluted runoff from agricultural areas draining into a river, or wind-borne debris blowing out to sea." Specifically how is HDF's operation any different than as defined nonpoint source discharge?

I hereby incorporate all of the questions and/or concerns voiced by the community at the Feb 19, 2014 meeting at Koloa Cafeteria that HDF and Group 70 put on for the community.

Please respond to the above questions in your draft EIS as they Speak to several of my concerns over Hawaii Dairy Farms operation and their choice of locating their dairy in an environmentally sensitive area.

I wish to be a party to this EIS and receive any and all notifications and emails.

E Kechloian

Eileen Kechloian
1722 Keoniloa Pl.
Koloa, HI 96756

backonisland@gmail.com

cc.
Hawai'i Dairy Farms, LLC.
P.O. Box 1690
Koloa, Hawai'i 96756-1690

Group 70 International, Inc.
925 Bethel Street, 5th Floor, Honolulu, HI 96813
Jeff Overton, Principal Planner

Hawai'i Dairy Farms

MAHA'ULEPU, KAUA'I

ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE

An Environmental Impact Statement (EIS) is being prepared voluntarily by the Applicant to assess potential environmental impacts and mitigation measures associated with agricultural operations at Hawai'i Dairy Farms (HDF) at Māhā'ulepū, Kaua'i.

To assist in preparing the EIS, an Environmental Impact Statement Preparation Notice (EISPN) was recently published. A 30-day public comment period on the EISPN ends February 23, 2015. The purposes of the publication and comment period are two-fold:

1. to allow individuals and groups to request to become a consulted party; and
2. to provide written comment regarding effects of the proposed action.

NOTE: Submitted comments will be published in the Draft EIS

COMMENT

Name: Eileen Kechloian Organization: _____

Preferred contact Method

Email: backonisland@gmail.com Postal Address: 1722 Keoniloa Pl Koloa 96756

Phone: (Optional)

Comments: HDF says they are a zero-discharge does they mean they are also a nopoint source discharge? Does zero-discharge mean only from effluent pond? What about the manure left on the ground? Why did you wait until the 19th of Feb, to have a meeting for the community when all the comments must be post mark Feb 23rd? Why did you think that Friday to Monday was enough time for those who need help writing? Why did you not have an opening prayer when it was requested as it a culturally appropriate practice? Why did you choose a venue that was too small to accomodate the people who stood outside?

Return to:

Group 70 International, Inc.
925 Bethel Street, 5th Floor
Attn: HDF Project
Honolulu, HI 96813
hdf@group70int.com

And/or:

Hawaii State Department of Health
Environmental Planning Office
919 Ala Moana Boulevard, Rm. 312
Honolulu, HI 96814
epo@doh.hawaii.gov

Deadline: February 23, 2015

May 26, 2016

Eileen Kechloian
1722 Keoniloa Place
Koloa, HI 96756
backonisland@gmail.com

Subject: Hawai'i Dairy Farms
Environmental Impact Statement Preparation Notice
Māhā'ulepū Road
Kaua'i, Hawai'i
TMK: (4) 2-9-003: 001 portion and 006 portion
(4) 2-9-001:001 portion

Dear Eileen Kechloian:

Thank you for your letter concerning the Environmental Impact Statement Preparation Notice.

HDF is committed to establishing a herd of up to 699 mature dairy cows to demonstrate the pasture-based system as an economically and environmentally sustainable model for Hawai'i. Precision agricultural technology that monitors cows' health, grass productivity, and effluent management will be used to ensure environmental health and safety, as well as best management practices, and help determine the ultimate carrying capacity of the land. With proven success at a herd size of 699, HDF will contemplate the possibility of expanding the herd in the future. For dairy operations with 700 or more mature dairy cows, additional regulatory review and permitting by the State Department of Health is required. At the discretion of HDF, management may choose to expand operations up to the carrying capacity of the land, which is estimated to be up to 2,000 productive milking dairy cows. Permit process compliance would be followed at such time HDF may decide to pursue an expanded operation.

The following responses are offered to your comments:

DAIRY OPERATIONS: Hawai'i Dairy Farms (HDF) will establish and operate a sustainable, pastoral rotational-grazing dairy farm in Māhā'ulepū Valley on the island of Kaua'i to produce fresh, locally available nutritious milk for Hawai'i families. The rotational-grazing method utilizes 100 percent of the cows' manure as natural fertilizer to grow pasture grass as a primary source of nutrition for dairy cows. This cost-effective method will reduce reliance on imported fertilizer and feed. Pasture grass will comprise at least 70 percent of the animals' diet. As a part of the Draft Environmental Impact Statement (EIS), the proposed facilities and operations for the dairy farm are described in Chapter 3.

The Environmental Impact Statement (EIS) Preparation Notice (EISPN), published January 23, 2015, described the proposed pasture-based rotational grazing system

as a "zero-discharge, grass-fed dairy". The term "zero-discharge" under the U.S. Environmental Protection Agency related to concentrated feeding operations (CAFO) is a system designed to not discharge pollutants into waters of the United States. As noted previously, the HDF system is designed to utilize 100 percent of the cows' manure on-site. However, nutrients would be introduced to the HDF site with any use; the Draft EIS identifies the amount of nutrients anticipated from the proposed dairy operations that could pass through to ground and surface waters. Therefore, HDF elected to discontinue use of the term "zero discharge" as it was construed as no nutrients into the system.

The term "grass-fed" was used in the HDF EISPN. This term was used to identify HDF's intent to utilize a locally-produced feedstock – grass – for more than 70 percent of the dairy herds' diet. In January 2016, the U.S. Department of Agricultural (USDA) Marketing Survey created a narrow legal definition of "grass-fed". The USDA standard defines what animals can and cannot be fed. The Food Alliance, a project of several northwest colleges, believes that when consumers choose grass-fed products there is an expectation that these will come from animals raised on pasture on a forage-based diet. Due to the evolving definition of "grass-fed", the term in not used in this EIS.

The dairy facilities will occupy an area of approximately 10 acres on the western boundary of the site. The developed area "footprint" will be less than 2 percent of the total farm area. Four buildings will be constructed to serve different functions, supported by utilities and infrastructure. Additional building information can be found in Draft EIS Section 3.3.1.

Agricultural infrastructure and utilities required for the dairy operations will include storage tanks and silos, effluent storage ponds, livestock water systems, and drainage improvements. The irrigation system and distribution of livestock water are discussed in Draft EIS Section 3.5, Pasture Management.

The pastoral rotational-grazing dairy provides a local feedstock – grass – as the herd's primary food source. Reducing imported feed stabilizes costs and provides a food source closer to the natural diet of cows. Results of grass trials initially conducted at five sites across four Hawaiian Islands were instrumental in identifying appropriate varieties of grass, and suitable sites to support sufficient "dry matter" grass yields essential to a cow's diet. Additional project-specific trials at the Māhā'ulepū site on Kauai have been conducted for more than 18 months. The results have identified sufficient yield and nutrition to supply 70 percent of the cows' diet; improvements in grass productivity are anticipated to provide up to 85 percent of cows' diet.

The pasture-based model allows cows to move about freely, and to lie down and rest, which is part of the digestion cycle. The animals are managed in social groups known as "mobs", mimicking the natural social order of bovines. Cows spend 22 hours of each 24-hour period foraging on pasture or resting, outdoors in natural light and fresh air. The gently sloped paddocks, walkways and races minimize the energy expended by the mature dairy cows as they graze or are transferred to and from the various paddocks and the mature dairy facility; surfaces of the walkways

and cow races are designed to provide a comfortable path under hoof. The management practices and pasture model applied by HDF maximizes grass as the cows' primary nutrition source and minimizes stress to the animals. Cows tend to be healthier and live longer, productive lives with access to fresh air, high quality feed, and exercise while they forage.

The 470 acres of pasture will be divided into paddocks averaging 3 to 5 acres in size. Smaller paddocks located near the dairy facility will be used as temporary pasture for cows or calves being moved on or off the farm. To protect the water quality of surface water and downstream areas, paddock fences are set back 35 feet from the edge of drainage ways throughout the site. Existing vegetation within the setbacks will be managed or restored to reduce erosion, improve stability of ditch banks, increase net carbon storage, and improve and maintain water quality.

The majority of the pastures will be irrigated with non-potable water and/or diluted effluent through either the pivot irrigation systems or through gun irrigators. Irrigation water supply is provided to the farm from Waita Reservoir, and will be filtered and pumped to the various irrigation components on the farm. The irrigation system is controlled using computer software and GPS receivers to allow very precise application of irrigation and/or diluted effluent on the pasture. The pivots can rotate and apply irrigation water and/or diluted effluent at different rates depending on the actual irrigation needs of the farm.

NRCS provides technical guidance on applying agricultural waste depending on the desired use of the waste. Reflected in the title of the livestock waste guidance for Hawai'i is the parenthetical inclusion of the word "nutrients." Where waste is utilized as a resource, it is being used for the constituent components that provide benefit.

The NRCS Conservation Practice Standard 590, Nutrient Management, applies to commercial fertilizers, organic by-products, waste water, organic matter, and irrigation water. Nutrient management is the practice of managing the amount, rate, source, method of application, and timing of plant nutrients and soil amendments. The timing and application of nutrients will correspond with plant uptake, soil properties and weather conditions. For more information on nutrient balance management see Draft EIS Section 3.5.3, and Draft EIS Appendix D.

The effluent storage ponds are sized to accommodate 30 days of storage for up to 2,000 mature dairy cows, and over 85 days of storage for 699 mature dairy cows. It will be highly unlikely that the storage pond will be full at any time for the contemplated 2,000-cow dairy, and nearly impossible for the committed 699-cow dairy. Throughout the less than 30-day storage period, effluent is planned for application every four days, and the slurry application is expected at least once every 45 days, to ensure that the ponds are kept at manageable levels.

Cows lactate milk following the birth of calves. Newborn calves will be housed on the Māhā'ulepū site and provided essential colostrum and nutrients for a healthy start. During the calves' initial 90 days, they will be transitioned to pasture at HDF before transfer to ranches on Kaua'i to be raised off-site. The committed herd size of

699 mature dairy cows at the Māhā'ulepū site applies to mature mature dairy cows. Animals in various stages of lactation and rest will be transferred between HDF and other partner ranches as needed for animal health and dairy productivity. This will benefit both the dairy and infuse the beef market in Hawai'i with a new, local source of pasture-raised calves. Male calves will become part of the beef cattle herd; heifers (young female calves that haven't given birth) will be raised until ready to return to the HDF herd as a birthing/mature dairy cow. For more information on off-site herd management, refer to Section 3.7 of the Draft EIS.

Health of the herd is of primary importance as the success of a dairy relies on cows effectively producing quality milk. All cows will be treated with a high standard of care. Dairy managers and caretakers will be trained and competent in handling animals to minimize stress and ensure the herds' welfare. A licensed veterinarian may prescribe use of antibiotics approved by the Food & Drug Administration (FDA) for treatment of illnesses. Adherence to guidelines that prohibit milk from cows undergoing antibiotic treatment will ensure no adulteration of milk. Routine laboratory tests of milk for traces of antibiotic residue will be conducted. HDF will not inject cows with bovine growth hormone, referred to as rBST or rBGH.

CLIMATE: Draft Environmental Impact Statement (EIS) Section 4.1 addresses climate conditions. Climatic conditions affect the growth of forage and the health of dairy cows. Heat stress can reduce the productivity of dairy cows, and suitable climatic conditions were an important consideration in siting the dairy.

The Po'ipū area is generally known for its mild conditions. The area's climate is greatly influenced by its inland location and valley topography. Winds in the Po'ipū area are generally from the east-northeast direction (tradewinds) ranging from 5 to 15 miles per hour. Wind conditions vary depending on season and weather conditions, as occasional storms can generate strong Kona winds from the south, and land breeze circulations can develop during times of weak tradewind conditions. Meteorological data for 2014 was obtained for the project site. The predominant winds from the northeast, and the strongest winds come periodically from the southwest.

Rain gauge data for a rain gauge located near the site off Māhā'ulepū Road was obtained from NOAA National Climatic Data Center. The data reveal that more than a week of consecutive rain is very unusual for Māhā'ulepū Valley. The rainfall events for 30 years were recorded (a total of 10,957 days from 1984 to 2013) and ranked based on days of consecutive rainfall (DAPR) and the corresponding multi-day precipitation total (MDPR). Data records show only five occurrences in the last 30 years with more than a week of consecutive rain. And rainfall exceeded 2.0 or more inches during only four occurrences, with 2.6 and 3.7 inches recorded (EIS Section 4.1). Average rainfall in Māhā'ulepū is just under 50 inches annually.

Changes to solar radiation and the hydrologic cycle large enough to affect climate would be large-scale and long-term. The scale of HDF is not large enough to influence global cycles of solar radiation and the hydrologic cycle. Minimal construction and an increase in ground cover density will not affect climate

processes. The 557-acre site is not large enough to have a regional influence on climate.

Annual rainfall, prevailing winds, and solar radiation conditions at the HDF site are well suited to growing dairy pasture grass and conducting pasture-based dairy operations. Neither the committed herd size of 699 mature dairy cows nor the contemplated herd size of up to 2,000 mature dairy cows will affect climate conditions over the short-term or long-term. No significant impacts are anticipated, and no mitigation would be required.

SOILS: Soil is an ecosystem that can be managed to provide nutrients for plant growth, to absorb and hold rainwater for use during dryer periods, to filter and buffer potential pollutants from leaving fields, to serve as a firm foundation for agricultural activities, and to provide habitat for soil microbes to flourish and diversify to keep the ecosystem healthy. Two rounds of independent soil sampling were undertaken at HDF to understand and characterize available soil nutrients and conditions. Section 4.3 of the Environmental Impact Statement (EIS) characterizes soil conditions, and anticipated impacts from effluent and supplemental nutrient application. Recommendations from Dr. Russell Yost and Nicholas Krueger of the University of Hawai'i at Mānoa are summarized. Their baseline nutrient report is included as Appendix C of the Draft EIS.

Soil conservation is a core principal behind establishment of the NRCS, which was formed out of the Soil Conservation Service to acknowledge its expanded role in watershed-scale approach using science-based tools and standards in agronomy, engineering economics, wildlife biology and other disciplines to aid landowners in implementation of conservation practices. NRCS conservation practices are listed in Chapter 3, Section 3.2; these practices codes identify design and construction standards related to drainage, materials, operations and applicable engineering standards. HDF will follow the developed Conservation Plan, which was approved by the West Kaua'i Soil & Water Conservation District in December, 2013.

The United States Department of Agriculture (USDA) Natural Resources Conservation Services (NRCS) has mapped and classified soils for more than 95 percent of the United States. Comments received during the initial scoping for this EIS included a "Custom Soils Resource Report for Island of Kaua'i, Hawai'i." The report was generated from the USDA NRCS website, which allows any internet user to define an area of interest, customize data results, and generate a Custom Soil Resource Report. The user can select or deselect parameters based upon which data the user would like to display. These user-generated reports are not evaluated by NRCS.

The NRCS soils classifications and descriptions provide a good information base, however, in-field soils testing is needed to identify existing soil nutrient levels and conditions. The most abundant soil types at the HDF site are Kalihi Clay at 32 percent, Ka'ena Clay Brown Variant at 29 percent, and Lualualei Clay at roughly 14 percent of the dairy site. Laboratory analysis of soil samples collected in 2014 identified levels of pH, phosphorus, nitrogen, potassium, calcium, magnesium, organic matter, salinity, micronutrients and other constituents. The results illustrate

that the soils are depleted of nutrients, which is typical for lands formerly used for sugarcane. The soil nutrient status and fertility demands of the primary crop, Kikuyu grass, were used to identify the quantities of nutrients required for productive grass growth. The soils data provide a baseline to guide adaptive nutrient management throughout establishment and maturity of the dairy.

A second round of field sampling was conducted in 2015, and focused on evaluation of soils characterized as "poorly drained", and established a quantitative baseline of soil salinity and sodicity to provide for future monitoring of soil health with application of manure effluent. Laboratory analysis determined electrical conductivity and exchangeable sodium percentage, in addition to nutrient levels of nitrogen phosphorus calcium, magnesium, and potassium.

Poorly drained is not an indication of low or poor infiltration. Infiltration refers to the ability of water to enter the soil surface, whereas "drainage" refers to the movement of water within or from the soil profile. Poorly drained soils typically have low hydraulic conductivity, or a slow rate of groundwater movement through the soil. This slow movement can create anaerobic conditions, which typically result in higher rates of denitrification. This is the conversion of potentially nitrates and nitrites to gaseous forms, which reduces the potential for impacts on waterbodies. In this way, "poorly drained" soils may represent less risk of nitrate and nitrite leaching to associated waterbodies than "well drained" soils (Yost, 2016).

As a result of reduced movement of water through the soil profile, the mobility of nutrients such as potassium and phosphorus is also reduced. Soil types at the HDF site are known to adsorb and retain large amounts of phosphorus. Under the NRCS phosphorus leaching index for Hawai'i soils, HDF soils show low risk for leaching. With low risk, phosphorus can be applied at rates greater than crop requirements if manure or other organic materials are used to supply nutrients.

The dairy's focus on robust and healthy grass growth will build organic matter in soils through use of manure as a natural fertilizer. Soil can incorporate carbon from the atmosphere, which benefits soil health. According to recent studies in the Soil Science Society of America Journal, the conversion of formerly tilled cropland to grazed pasture can drive substantial accumulation of organic carbons in soil, with a potential to offset up to one-third of the annual increase in atmospheric carbon dioxide. The potential soil organic matter and carbon dioxide sequestration benefits are likely greatest in highly degraded soils in warm subtropical climates, partly due to long pasture-growing seasons. Long-term soil impacts are anticipated to result in improvement to the physical, chemical, and biological condition of the soil.

NATURAL HAZARDS: The potential impacts of natural hazards are evaluated in the Draft Environmental Impact Statement (EIS), including flooding, tsunami, earthquakes, and hurricanes. Draft EIS Section 4.6 addresses natural hazards.

The Māhā'ulepū property is not known to experience flooding conditions. The area is located within Federal Emergency Management Agency (FEMA) Zone X, areas determined to be outside the 0.2% annual chance floodplain. The proposed location for Hawai'i Dairy Farms (HDF) lies between the 60 and 150 feet elevation, outside

the tsunami evacuation zone. The Kaua'i and Ni'ihau region of the Hawaiian Islands has experienced tremors from earthquakes originating further south in the island chain, but no known seismic activity has originated among these northern islands.

Although they occur infrequently, Kaua'i has received a greater amount of damage from hurricanes when compared to the other Hawaiian Islands. Land management personnel in the Māhā'ulepū region during and following the hurricanes that affected Kaua'i in 1982 and 1992 observed defoliation of vegetation, and no flooding events in the period following passage of the storms.

Preparedness is the best protection for natural disasters. Structural design of dairy facilities will meet International Building Code (IBC) 2006 standards with local amendments. Provisions in design will address wind loading (including hurricane gusts), rain and flood loading, and earthquake loading. A geotechnical evaluation of the area recommended Seismic Site Class D under IBC standards be utilized for foundation design where the barns and agricultural infrastructure will be constructed.

There has been no rainfall event that would exceed the capacity of the effluent ponds since rainfall has been recorded in Māhā'ulepū Valley. The effluent pond capacity has been designed above the regulatory requirement to contain the 25-year, 24-hour rainfall event. An emergency containment berm with additional capacity for another 30 days is included in the design. This design exceeds regulatory requirements, with containment in excess of the major rainfall events recorded on Kaua'i over the past three decades.

An emergency preparedness plan for protection of animals has been prepared for HDF internal use that addresses hurricane, fire, and potential flooding hazard scenarios. HDF is not in a tsunami inundation area, so this scenario is not planned for in the disaster plan. The disaster plan relies upon knowledge of cow behavior, and is based on extensive guidance for livestock protection from NRCS, the Florida State Agricultural Response Team (SART), Pennsylvania State College of Agricultural Sciences, and Cornell University Cooperative Extension. The plan includes safety procedures during any disaster, follow up actions, and emergency contacts for assistance before, during or following the event. Further information is provided in the Draft EIS Section 4.6.2.

ARCHAEOLOGICAL AND CULTURAL: The Hawai'i Dairy Farms (HDF) project is subject to a historic preservation review by the State Department of Land and Natural Resources, State Historic Preservation Division (SHPD) under HRS Chapter 6E and Chapter 13-284. An Archaeological Inventory Survey (AIS) and a Cultural Impact Assessment (CIA) were conducted by Scientific Consultant Services (SCS) for the proposed project. EIS Sections 4.7 and 4.8 provide an evaluation of archaeology and cultural resources, with technical studies in Appendix G and H.

A total of sixteen historic properties were identified through a pedestrian survey of the project area and an extended survey area of 100 meters of the northern boundary. Six historic-era sites occur in the project area and 10 sites occur in the extended survey area. Only one of the sites is believed to be associated with pre-

Contact and/or early historic times. State Site 50-30-10-2250, the agricultural heiau, and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area. The remaining sites consist of historic-era bridges, ditches, culverts, retaining walls, and a flume system dating from the 20th century and are affiliated with sugarcane cultivation.

That a majority of the documented sites are related to the historic-era is not surprising, given the massive landscape modifications that occurred during intensive sugarcane cultivation on the valley floor. Even historic era cultural materials associated with the many Land Commission Awards in the project area were non-existent, as explored through survey and subsurface exploration.

The sixteen historic properties have been assessed for significance by the archaeological consultant and the dairy project is anticipated to have no impact on these sites. No further archaeological work is recommended for the sites. Two of the sixteen sites are considered significant under multiple criteria, but occur outside the project area on lands owned by a different landowner. Both sites will not be adversely affected by the proposed dairy project. No site is related to burials, and no bonex were found. Such sites have been reported along coastal areas in sand dunes.

The cultural assessment examined the potential effect of the project on cultural resources, practices or beliefs, its potential to isolate cultural resources, practices or beliefs from their setting, and the potential of the project to introduce elements which may alter the setting in which cultural practices take place. Information received from the community indicates the Māhā'ulepū Ahupua'a, has been and is currently used for traditional cultural purposes. However, the dairy project area has not been included in these activities. It is clear that the gathered plants, trails, State Site 50-30-10-2250, the agricultural heiau, and State Site 50-30-103094, a carved petroglyph boulder, are all located outside of the project area.

The project will be fully enclosed by perimeter fencing along the boundary of the leased premises, which will ensure that project activities and any related impacts are contained within the project area. Based on the research and comments received from the community, it is reasonable to conclude that, pursuant to Act 50, the exercise of native Hawaiian rights or any ethnic group related to numerous traditional cultural practices will not be impacted by establishment of the dairy.

FLORA AND FAUNA: Botanical, avian, and mammalian surveys of the property were conducted for the Draft Environmental Impact Statement (EIS) to assess existing species on site, including identifying any species listed as endangered, threatened, or proposed under any state or federal endangered species programs in or near the property. EIS Sections 4.9 and 4.10 address the evaluation of flora and fauna resources, with technical studies in Appendix A and B.

A botanical survey of the dairy property was conducted in August 2014 by AECOS Consulting to assess existing plant species. The survey also investigated for the presence of plants currently listed as endangered, threatened or proposed for listing under Federal or the State of Hawai'i's endangered species programs, located onsite or within the immediate vicinity of the dairy site. The nature of the land and its

present and historical uses for intensive agriculture very much limit the natural botanical resources anticipated to occur on this land. Complete species lists are included in the EIS, and no protected botanical species occur on the project property. The project will include vegetated buffer strips along the drainage ways as part of the Conservation Plan to reduce erosion and stabilize slopes. Where native plants occur or could survive if planted, native plants will be used in the stabilization. No long-term impacts to native plant habitats or endangered or threatened plants species will occur as a result of the dairy.

Avian and mammalian surveys were conducted in August 2014 by Rana Biological Consulting, Inc. This survey was conducted to assess the potential presence of avian or mammalian species currently listed as endangered, threatened or proposed for listing under either Federal or the State endangered species lists. The survey covered the dairy site area and immediate vicinity. Common birds and terrestrial mammals were encountered on the property. There is no critical habitat for endangered species in the upper Māhāʻulepū Valley.

Four species of endangered waterbirds were recorded on the site and at the nearby taro farm located within the HDF site. Though the area does not provide critical habitat, seabirds that nest in upland areas of Kauai may overfly the site. The endangered Hawaiian goose, nēnē was also seen on the site. State Division of Forestry and Wildlife biologists have noted nēnē are regularly seen on the subject property. It is probable that some nest on or adjacent to the site as this species nests in the general Kōloa area, and the habitat present on parts of the site is suitable for nēnē nesting.

The principal potential impacts posed to the five endangered species include those potentially associated with construction activities, and those associated with dairy farm operations following build-out. Measures will be adopted to avoid potential seabird and nēnē goose collisions with fences and structures. Potential measures include lowering construction cranes at night, using conservation fencing to project-specified areas, marking tall structures and fencing with white visibility polytape, limiting nighttime lighting, and shading any outside lights used at night. Ongoing mitigation strategies will be implemented for day-to-day preventative measures, including an Avian Species Protection Plan. Mitigation measures are further described in DEIS Section 4.10.2.

It is also likely that Hawaiian hoary bats overfly the project area on a seasonal basis. While caution will be taken during any potential disturbance or vegetation removal, there are almost no suitable roost trees within the dairy site, thus it is expected that the dairy farm will not affect this listed mammalian species.

PESTS: A study of invertebrate species and pest insects was conducted by Steven Lee Montgomery, PhD, Consulting Biologist in January 2016. The study summarizes the presence or absence of native species or pest species associated with cattle manure in the general Māhāʻulepū area, as well as the parasites and predators that control those species. No federally or state listed endangered or threatened

invertebrate species were noted in the survey of the site. A full report and list of species found on site is provided in EIS Section 4.11 and Appendix B.

Flies were identified on the HDF site using manure from neighboring livestock as bait for invertebrates. The two flies associated with livestock are the stable fly and the horn fly, the latter known for biting cattle. These flies and the greenbottle fly are often confused with the house fly. Flies known to exist on Kauaʻi but not seen at the HDF site include the house fly, the dog dung fly, and the chicken dung fly. These pests are common in areas with high pet populations. It is possible these fly species could inadvertently be brought to the dairy and utilize manure as a food source. HDF will prevent and control fly population growth through diligent clean up and sanitation practices regarding any trash and food waste, as well as through efficient manure composting practices. A full list of site management measures is provided in EIS Section 4.11. The project location does not provide any habitat for *drosophila musaphilia*, the only Kauaʻi species of native Hawaiian fly listed as Endangered or Threatened. Native Drosophila habitat is located many miles away in the high elevation koa-ʻōhiʻa forests.

Fly populations at HDF will be minimized through a process known as Integrated Pest Management (IPM). Essentially, IPM disrupts reproduction with appropriate means at key points in the pest's life cycle. Used in Hawaiʻi for decades, a number of invertebrates and a bird (the cattle egret) were introduced between 1898 and 1950 to reduce livestock-related insects. IPM utilizes knowledge of the ancient food web among species.

An especially important insect to minimize fly breeding habitat in manure is the dung beetle, which buries manure and incorporates it into the soil. Populations of dung beetles found on Kauaʻi and those species already in Māhāʻulepū Valley, will increase with the increased manure food source, thus increasing and speeding breakdown of manure. Dung beetles are specialists in the very important natural process of breaking up and quickly recycling bovine manure pads. The behavioral diversity among dung beetle species will work together to bury dung pats in one to three days, a shorter amount of time than the 10-30 days flies eggs need to hatch.

In the Kōloa-Poiʻpū region, pest fly populations are dependent upon food and breeding sources nearby such as dog, cat, and chicken feces. Beef cattle graze in the region on agricultural lands along Ala Kinoiki Road between Kōloa and Poiʻpū, and it is likely the livestock-related flies identified at the HDF site occur in this region as well. Localized controls to reduce pest populations need to address breeding sites in and amongst the food and animals wastes within the area. These mitigation measures will make it difficult for flies to breed, and BMPs will be enforced to address any increase in population, therefore it is expected that the dairy farm will not significantly affect recreational and resort areas.

NOISE: Existing noise conditions of the project site and the surrounding Māhāʻulepū valley area are evaluated in the Draft Environmental Impact Statement (EIS), along with anticipated short-term and long-term noise conditions associated with the

dairy farm and planned mitigation actions. Draft EIS Section 4.12 addresses noise conditions.

Noise can be defined as unwanted sound, a sound that is considered loud or unpleasant, and/or sound that causes disturbance. Research related to noise and livestock focuses on noise levels and minimization of unexpected sounds that cause undue stress on cows. Noise stress results in loss of livestock productivity and thereby financial loss to farmers and ranchers. Little research exists on the sound levels from livestock.

Sound is measured in decibels (dB). The State of Hawai'i Department of Health (DOH) rules use the A-weighting sound network (dBA) in the HAR §11-46, Community Noise Control. Sound through the air is similar to ripples on a pond of water. In open space without reflection, ripples spread uniformly in all directions and decrease in amplitude further from the source. In free field conditions such as outdoors, amplitude drops by half as distance doubles (OSHA, 2016). When sound passes close to absorbing ground cover such as grassland and fields, the "soft ground" absorbs extra sound as it passes. The Hawai'i Dairy Farms (HDF) site in Māhā'ulepū Valley is approximately 2 miles from the resort area, and 1.5 miles from the closest residential areas (on land zoned for agriculture). Typical noise currently generated near the HDF site includes truck ingress/egress along private farm roads, agricultural equipment, and cattle and sheep.

Construction work at the project site will involve activities that may generate an increase in noise levels. However, such exposures will be a short-term condition, occurring during daylight hours. Construction vehicles and activities must comply with DOH Administrative Rules. DOH noise control regulation requires a permit for construction activities that emit noise in excess of 78 decibels or that cost a total of more than $250,000. Mitigation measures to minimize construction noise will include the use of mufflers to suppress loud equipment and limitations on the hours of heavy equipment operation.

The dairy farm will utilize milking equipment contained in the milking parlor, and will use field equipment such as tractors. Under HAR §11-46, agriculture is classified as Zoning District Class C, which specifies maximum permissible sound levels of 70 dBA in the daytime and 70 dBA at nighttime. Dairy operations will generate noise in keeping with agricultural zoning of the parcel. The primary noise receptors in the area would be farmers working nearby parcels. Noise from the dairy will not exceed the DOH threshold, and will not contribute to excessive noise in the region.

DEMOGRAPHIC AND ECONOMIC: The potential impacts of Hawai'i Dairy Farms (HDF) to the existing economy were evaluated in the Draft Environmental Impact Statement (EIS), including a fiscal impact assessment report completed in April, 2016 by Plasch Economics Pacific. Draft EIS Section 4.15 addresses demographic and economic factors, with the complete report in Appendix J.

The HDF project would create short-term benefits through jobs for local construction personnel and local material suppliers. Such jobs would include

equipment operators, cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, supervisors, painters, etc. Based on State employment multipliers, indirect employment related to Dairy construction would be expected to average about 16 jobs on Kaua'i, and 8 on O'ahu. Construction employment would be expected to average about 12 jobs per year during the development period. Thus direct-plus-indirect employment association with construction would be expected to average approximately 36 jobs, of which 28 would be on Kaua'i.

The HDF project would contribute to diversification of Kaua'i's economy, which is heavily based on the visitor industry. With only two dairies remaining in the State (both on the Hawai'i Island), approximately10 percent of Hawai'i's milk is locally supplied. The HDF project, with an established herd of up to 699 mature dairy cows, will increase the supply of local fluid milk by approximately 1.2 million gallons of milk annually, a 50 percent increase in statewide milk production. On-going dairy operations at the committed herd size will provide approximately 16 direct and indirect full-time equivalent jobs on Kaua'i, including 5 farm jobs and about 11 indirect jobs. An additional 6 indirect jobs related to on-going dairy operations would be created on O'ahu.

HDF is expected to generate a net income of approximately $68,000 to the County when the 699 cow herd is established. When the dairy has matured to full production for the 699 cow dairy, net income to the State is calculated at $160,000 annually. With the potential contemplated herd size of up to 2,000 mature dairy cows, approximately 4.4 million gallons (36,719,780 pounds) of milk would be produced. This would double local milk production currently supplied by operational dairies on the Island of Hawai'i.

Additional employment generated by a possible expansion to accommodate the contemplated 2,000 mature dairy cow herd is estimated at approximately 3 construction jobs plus 4 indirect jobs on Kaua'i, and 2 indirect jobs on O'ahu for a total increase of 9 jobs. For on-going operations at the contemplated herd size, an additional 5 full-time farm jobs would be added, with approximately 15 additional indirect jobs on Kaua'i and another 8 indirect jobs on O'ahu.

The dairy is expected to generate a net additional contribution to the County of approximately $8,000 for improvements related to expansion for the contemplated herd size of up to 2,000 mature dairy cows ($76,000 total versus $68,000 for the committed herd size). The State will derive approximately $360,000 annually in revenues from the contemplated 2,000-mature dairy cow dairy.

Results of technical studies and the findings of this Draft EIS show no unmitigated nuisances that could affect property values as a result of dairy implementation or operations. No noticeable odors, flies, noise, waste or water discharges will impact resort or residential areas. As such, the dairy will not adversely affect residents, nearby recreational activities, guests in nearby resorts, or diminish property sales or property values in the area.

WATER QUALITY: Technical consultants conducted field studies and analysis on groundwater and surface water resources in the area, and evaluated potential impacts from the proposed Hawai'i Dairy Farms (HDF) actions. Existing conditions and probable impacts are presented in the Draft Environmental Impact Statement (EIS) sections 4.16, 4.17, 4.22 and 4.23; the technical reports are in Appendices E and F. The location and connectivity of groundwater bodies were determined, and the quality of groundwater and surface water was documented.

GROUND WATER

Hydrology: The area's hydrology is shaped by its geology. The Kōloa area was built by Napali formation lavas of the Waimea volcanic series. Surface lavas of the Napali formation exhibit extensive weathering which may extend to considerable depths – as great as 400 feet below sea level. Weathered lava in the area is typically Saprolite, a soft, thoroughly decomposed rock. The Māhā'ulepū Valley floor is filled with alluvium, which generally extends about 60 feet under the surface and is underlain by highly weathered lava at a shallow depth by secondary eruptions of the Kōloa series. The alluvial material is highly weathered lava and is comprised of dark brown to black silty clay and clayey silt.

The groundwater and surface water analysis conducted for this Draft EIS identified two groundwater bodies within the valley: (1) groundwater located in a deep aquifer system within unweathered volcanic material, which is buried beneath thick alluvium that covers the valley floor, and (2) groundwater in the thick alluvium. The aquifer of highest value and use resides deep within the unweathered volcanic material. The alluvial material blanketing the valley floor is less permeable than the unweathered volcanics by orders of magnitude. Hydraulic conductivity represents the ability of soils to transport water given a hydraulic gradient, and is expressed in units of feet per day. It is a measure of how easily water will move within the ground. The hydraulic conductivity of the alluvium that underlies Māhā'ulepū Valley and the HDF site ranges from 10.5 – 50 feet per day. The hydraulic conductivity of soils in the adjacent Kōloa-Po'ipū region is on the order of 201 – 500 feet per day. Therefore, water movement through soils under the proposed dairy site is 10 times slower than the neighboring area.

The groundwater and surface water analysis for this Draft EIS examined whether the two waterbodies within Māhā'ulepū may be connected. Four studies were conducted to determine whether the shallow groundwater in the alluvial material might discharge into the lower aquifer confined in the unweathered volcanic material at depth, which is the source of potable water. The results demonstrate there is no hydrologic connection between the deep aquifer in the unweathered volcanic series and the groundwater body in the alluvium. Section 4.16.1 of the Draft EIS provides further detail.

Potable Water: Once fully operational at the committed herd size of 699 mature dairy cows, the dairy will utilize 30,000 gallons per day (gpd), which is 0.03 million gallons per day (MGD), of potable (drinking water quality) water from groundwater provided through an on-site well. The State of Hawai'i Department of Health Milk Rules require that potable water be used for milk production, both in the milking

parlor and for milking operations; another potable water use will be for livestock drinking water. Should HDF decide, in the future, to expand to the contemplated herd size of up to 2,000 mature dairy cows, potable water demand will increase to 84,800 gpd (0.085 MGD). These demands are a small fraction of the 3 MGD produced by the on-site, existing Māhā'ulepū 14 well during the sugarcane plantation era. All potable water used as wash water will be re-applied to pasture and thus remain a part of the evapotranspiration cycle. Long-term groundwater supply impacts are not anticipated to be significant.

The assessment concludes that the modest potable water demand from the dairy operation, and the 4,500-foot distance between the Māhā'ulepū 14 well and the County's Kōloa F well, will result in no adverse impacts to ongoing use of groundwater in the volcanic aquifer layer, which is the source of potable water. Groundwater in the alluvium will not impact the County drinking water well.

Though the waterbody in which the County wells occur is confined and hydrologically separated from shallow groundwater in the Māhā'ulepū Valley, HDF established a 1,000-foot setback surrounding the Kōloa F well in agreement with the County Department of Water. Within this setback, no effluent will be applied and no animals will deposit manure as the area will not be used for grazing. Additional setbacks to protect water resources are included in the Surface Water section.

Groundwater Monitoring: Four groundwater monitoring wells were installed by HDF into the shallow groundwater within the alluvium to allow monitoring of water quality. Baseline data on water quality for both groundwater in the alluvium and groundwater in the deep aquifer were documented. Future monitoring will allow comparison between conditions prior to, and during, HDF operations. Results from the monitoring program will be shared with the Department of Health Clean Water Branch, dairy neighbors and the local Kaua'i community.

Regional Water Demand: The adjacent, developed Kōloa-Po'ipū region shows large and increasing demand for potable water for community and resort development. The State Department of Economic Development and Tourism (DBEDT) projects the population of Kaua'i will increase county-wide by 17,300 residents by 2030. The South Kaua'i population is estimated to reach 16,855 in 2035, when it is projected to encompass 19.2 percent of the County population. For the South Kaua'i region (the Kōloa - Po'ipū - Kalāheo districts), water use in 2035 is projected to be 3.24 MGD, an increase of nearly 1 million gallons per day. An evaluation of the island's infrastructure capacity for projected growth in population (both residents and visitors) through the year 2035 predicts the island will be facing a shortage of well water. Water resources must therefore be carefully managed to accommodate the projected growth and water demand anticipated in the region through 2035.

SURFACE WATER

The State Department of Land and Natural Resources Commission on Water Resource Management has established surface water hydrologic units for managing surface water resources. The project area is located within the Māhā'ulepū Surface

Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhāʻulepū watershed.

The HDF site is located on the bottom-land of the upper Māhāʻulepū Valley, which is fed by several intermittent streams coming off of the south slope of the Haʻupu Ridge. These normally dry streams converge into man-made channels running through the HDF site across the valley floor, and meet a concrete ditch that parallels lower Māhāʻulepū Road. This ditch, named Waiopili Ditch, is joined by a reach from the west that originates at a small unnamed reservoir, and continues off site towards the south.

Potential Impacts from Construction: The dairy facility and associated infrastructure will be constructed in a 10-acre area located along the site's western boundary. Built facilities within this area will total less than 2 percent of the HDF site. A Stormwater Pollution Prevention Plan (SWPPP) has been developed as part of the application for the National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit. Management controls will include: minimizing exposure of disturbed surfaces; monitoring and repair of structural controls; and prohibiting leaking or poorly-maintained construction equipment and machinery. Structural controls to be utilized during construction will include: silt fence installed in key locations; sand bags barriers in swales; and geotextile filter fabric and sediment logs around drain inlets.

Surface Water Quality: The Kauaʻi Chapter of the Surfrider Foundation began collecting water samples in Waiopili Ditch near the bridge accessing Makauwahi Cave Reserve in April of 2014. The group reported high levels of enterococcus to the State Department of Health (DOH) and provided its data, however, DOH was unable to utilize the data as it did not meet Clean Water Branch (CWB) quality assurance/quality control requirements, and it could not be used for regulatory purposes. CWB had not conducted water quality sampling for either nearshore recreation waters at the terminus of Waiopili Ditch, or of surface waters in the Māhāʻulepū Surface Water Hydrologic Unit as the remote areas are on private lands.

Complaints from the public citing the high levels of enterococcus in Waiopili Ditch and concerns about the proposed dairy prompted CWB to conduct a "Sanitary Survey" of the Māhāʻulepū and adjacent watersheds. DOH conducted water sampling within the Waiopili Ditch and areas upstream, and initiated a series of investigations into water quality issues. Following EPA standards for a Sanitary Survey, DOH has completed Part I of its report: *Waiopili Ditch Sanitary Survey, Kauai, Part I*. The Sanitary Survey found no significant impact to the ditch from any activity that could be attributed to the dairy. Feral animal waste, decaying organic debris and inputs from existing agricultural operations may all be contributing factors in the indicator levels found in ditches running through Māhāʻulepū Valley. The dense canopy along the makai end of Waiopili ditch blocks ultraviolet rays, which could help reduce bacteria levels. CWB noted that Waiopili Ditch is a man-made drainage on private property, and is not an inviting recreational body of water utilized by people. The Sanitary Survey can be accessed on the DOH Clean Water Branch website under "Library" (http://health.hawaii.gov/cwb).

Long-term Operations, Setbacks and Buffers: Normal ongoing farming and ranching activities are exempt from the Clean Water Act Section 404. HDF received confirmation of exemption for maintenance of existing drainage ditches from the Honolulu District, U.S. Army Corps of Engineers (USACE) in 2013. Additional practices are anticipated to fall under the exemption for construction or maintenance of existing or new animal walkways, stream crossings, and farm roads in accordance with best management practices.

HDF operations will follow the practice standards of the Natural Resources Conservation Service (NRCS). These practices include setbacks to reduce runoff that could carry particles into surface waters. Fences will be erected 35-feet from the top of drainageway (totaling 70-feet in width) to keep cows away from surface waters. Vegetated buffers will be established between the fences and drainageways to create filter strips that could capture particulates during stormwater runoff events. Another setback restricts application of effluent within 50 feet of the drainageways; only irrigation water will be used in these areas as needed to maintain the vegetated buffer and pasture grass, keeping nutrient applications away from waterways.

Nutrients from Effluent Irrigation and Commercial Fertilizer Application: The natural fertilizer from manure deposited directly to pasture and effluent collected from the milking parlor is insufficient to meet the agronomic need of the pasture grass crop with the committed herd size of 699 mature dairy cows, and supplemental commercial fertilizer will be required. Nutrients required to sustain the 470 acres of pasture are the same for the future contemplated herd size of up to 2,000 mature dairy cows, though the proportion of nutrients supplied as natural fertilizer (manure and effluent) and commercial fertilizer changes. With the potential future contemplated herd size, supplemental nitrogen will be needed, and a small excess of phosphorus could occur. However, with an increase in dry matter (DM) yield (a measure of grass growth) of one ton per acre, phosphorus would be in a deficit and require commercial supplementation. Grass yields are anticipated to increase more than three tons DM per acre with dairy establishment, from the current 16.2 tons DM per acre to 20 tons DM per acre. Section 4.23 of the EIS provides additional information.

The groundwater and surface water analysis conducted for the Environmental Impact Statement estimated that surface water from Māhāʻulepū will carry three times more nutrients than groundwater, due to the poor permeability of the alluvium. Groundwater can discharge from the alluvium when it rises in wetter periods and intersects the deep drainage ditches. Such discharge to the channels could occur on an episodic, seasonal basis when rainfall exceeds 0.8 inches.

The groundwater engineer estimated potential nutrient pass-through to groundwater from the HDF nutrient budget at two percent of nitrogen (totaling 10,000 pounds per year), and one percent of phosphorus (totaling 900 pounds per year). Again, this nutrient run-off would not occur as chronic daily release, rather, the runoff contributions would be limited to periods of the major rainfall over 0.8 inches. Such rainfall events are estimated to occur approximately three percent of days, or an average of 10 days annually. Per best practices, no effluent application would be conducted during such weather events.

To provide perspective, nutrient inputs from the adjacent Kōloa-Poʻipū region were also calculated. Nitrogen input to the marine environment in the Poʻipū region is calculated to be 38,510 pounds annually, or 3.5 times more than the estimate of potential nutrient throughput from HDF. Phosphorus for both domestic wastewater and landscape fertilization in the region is estimated to be 1,260 pounds annually, or 1.4 times greater than the potential discharge from HDF. The nutrient inputs from domestic uses in the Poʻipū region are constant throughout the year and no mitigation is applied to reduce the quantities.

Impacts to the Nearshore Marine Environment. An assessment of groundwater and surface water interaction with the marine water downgradient from the dairy site was conducted by Marine Research Consultants, Inc. (MRCI). Surface water from the Waiopili Ditch provides the majority of freshwater input in the immediate coastal area. Water chemistry measurements made by MRCI identified mixing of ditch water occurs rapidly and within a short distance of the shoreline.

The minor contributions of nutrients from episodic rainfall anticipated to occur just 10 days annually from dairy operations will not adversely affect ocean water quality and the marine environment. The nearshore area is a highly mixed environment which actively disperses inputs within several meters from shore. Comparing nutrient constituents in surface water samples taken from the HDF site and the agricultural ditches down gradient to nutrients sampled in the nearshore ocean water revealed that indicator bacteria were substantially lower in the ocean than in the ditch. The rapid decrease is likely a result of both physical mixing of water masses and toxicity from saline water. In any event, the elevated levels of indicator bacteria do not extend beyond the shoreline. Baseline water quality data and the surface and marine water impact report is included in the Draft EIS as Appendix F.

Establishment of Water Quality Monitoring: Long-term ocean water quality monitoring will be instituted in conjunction with the surface water quality monitoring, to regularly sample and analyze the nearshore ocean waters. The ongoing testing program will provide feedback to the dairy management team to help ensure that nutrients and bacteriological constituents are not being released at levels of environmental concern. Data from the nearshore water monitoring program will be shared with the DOH CWB, dairy neighbors and the local Kauaʻi community.

AIR QUALITY: As a part of the Environmental Impact Statement (EIS), existing air quality conditions and project impacts were evaluated, including dust and odor. Potential odors and emission levels for air pollutants relevant to dairy operations were modeled, as currently there are no cows on site. EIS sections 4.19 and 4.25 provide an evaluation of air quality and odors, including a windrose depicting wind speed and direction in the area (see DEIS Section 4.1, Climate). The full air quality technical report can be found in Draft EIS Appendix I.

Clean Air Act

Under the *Clean Air Act of 1970* (CAA), amended November 1990, the U.S. Environmental Protection Agency (EPA) regulates both large and small sources of

air pollutants by establishing National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. The State of Hawaiʻi has established its own *State Ambient Air Quality Standards* (SAAQS) that are as strict or, in some cases more strict than the NAAQS. State standards prohibit any visible emissions of fugitive dust from construction activities at the property line.

Emissions relevant to livestock operation include particulate matter and fugitive dust. Greenhouse gases related to dairy cows include methane (CH_4) from enteric fermentation, and both methane and nitrous oxide (N_20) emissions from manure application. No State or Federal regulations for greenhouse gas emissions from farm operations or small businesses currently exist.

DUST

Dust will be generated as cows move along soft limestone walkways that connect the paddocks and lead to and from the milking parlor. Potential fugitive dust emission rates were estimated from published literature, where particulate matter (PM) is measurable from the "drylots" of confined dairy operations where animals walk over dirt and dried manure throughout the day.

Applying the emission rates from this available literature greatly overestimates potential emission resulting from HDF. Cows in the pastoral rotational-grazing system will be on pasture 22 hours each day and will spend two hours – in two separate milking cycles –moving to and from the barn for the 10- to 15-minute milking sessions.

Using atmospheric dispersion modeling system (AERMOD), the rates were scaled to the size of the non-pasture areas used by cows at HDF. Results were added to the background concentration of particulate matter (both PM_{10} and $PM_{2.5}$) measured on the island of Kauaʻi, and the total concentration was compared to the State ambient air quality standards. Only the contemplated herd size of up to 2,000 mature dairy cows was modeled, as at the lower threshold of 699 cows, the potential fugitive dust impact would be negligible. The estimated concentration for PM_{10} is 2.01 $\mu g/m^3$, well below the State standard of 150 $\mu g/m^3$. The estimated concentration for $PM_{2.5}$ is 0.23 $\mu g/m^3$, well below the Federal standard of 35 $\mu g/m^3$ (see Draft EIS Section 4.19 and Table 4-19.2).

ODOR

Odor emissions are generated during incomplete anaerobic decomposition of organic matter in manure. No animals or dairy facilities currently exist in the area leased by HDF, so air dispersion models were used to determine potential odor levels. Local weather data was used in conjunction with the AERMOD modeling system, and published rates for manure odors emissions for dairy heifers and effluent ponds were adapted to reflect the HDF facilities.

Odor emission sources identified for modeling at HDF were manure in the pasture fields, irrigation water containing diluted nutrients from effluent, the effluent storage ponds, and the dairy buildings. Odor rates from published research were

applied. Odor isopleths (a line used to map all points having the same numerical value) were created to display the model findings. Odor is described in "odor units" at the threshold of perception, which is defined by the point at which 50 percent of panelists, in laboratory conditions, cannot smell the odor but 50 percent of the panelists can detect the odor.

Modeling results were generated for worst case meteorological conditions (low wind velocity / mixing). Generally, tradewinds will disperse odors to less than detectable levels beyond the HDF site; in periods of no wind, odor may not be dispersed creating the "worst case" scenario. In these periods without normal tradewind flow, the odor plume would extend to the south of the HDF site. Sections 4.19.2 and 4.25.2 of the EIS include graphics of the potential odor isopleths.

Results for the committed herd size of 699 mature dairy cows show that odors may be detectable by 50 percent of the sensitive population once per 200 hours, or 44 hours per year, within an area that extends approximately 1,670-feet (within one-third of a mile) beyond the dairy farm boundary, and does not reach recreational or residential areas. Results for the contemplated expanded herd size of up to 2,000 mature dairy cows show odors would not extend beyond 2,780 feet outside the HDF boundary (just over half a mile), again not reaching recreational or residential areas, and again with detection limited to 50 percent of the sensitive population approximately 44 hours per year. The parameters used in the analysis were intentionally conservative, and the impacts shown assume an unlikely confluence of worst-case meteorological data, irrigation location, and grazing location. Actual offsite odor impacts are likely to be much lower and/or less frequent than shown; it is likely odor detection beyond the HDF boundaries will be less frequent.

ALTERNATIVES: As a part of the DEIS, alternatives were evaluated that could attain the objectives of the action's purpose and need, and were compared with environmental benefits, costs, and risks of each reasonable alternative against those of the proposed dairy project. Further discussion of alternatives can be found in DEIS Section 6.

The DEIS evaluates alternatives that could attain the objectives of the action's purpose and need, and compares environmental benefits, costs, and risks of each reasonable alternative against those of the proposed action. Additionally, reasonable land use alternatives that emerged from public input during the project scoping phase are documented and briefly discussed. The alternatives that do not meet the project purpose are not advanced for analysis of environmental benefits, costs, and risks. The Environmental Impact Statement Rules, Hawai'i Administrative Rules Chapter 11-200 (HRS 11-200) requires a discussion of alternatives that could attain the objectives of the action, regardless of cost. There is no requirement for the alternatives analysis to consider every possible land use.

Four possible land uses that would not meet the project purpose are discussed. Rezoning the land for resort or residential development, or a potential conservation condemnation are two uses that were examined and eliminated from analysis. These options would not be reasonably viable given the existing private land tenure and existing zoning. Two additional alternatives were considered as reasonable land

uses as they could be permitted within the existing State Land Use Agricultural District and County Agricultural Zoning District. These options include Agricultural Park with Processing Center, and development of an Agricultural Subdivision. The alternatives were examined and eliminated from further analysis, however, as they would not fulfill the project purpose.

The analysis, therefore, focuses on alternatives that meet the project purpose. Rigorous exploration and evaluation of the environmental impacts of the alternatives, including those that might enhance environmental quality or avoid, reduce or minimize some or all of the adverse environmental effects, costs and risks. These alternatives include: (1) the development of a Conventional Feedlot Dairy (a non-pasture-based dairy) at the same location; (2) development of the Pasture-Based Dairy at an Alternative Location on Kaua'i; and (3) milk products processing by HDF. The alternative of "No Action" is also evaluated.

The alternatives analysis provides a comprehensive evaluation of the range of potential alternatives, including the two alternative development scenarios. Although the alternatives are potentially reasonable uses under existing zoning and neighboring uses, each fails to comprehensively fulfill the project requirements defined by the eight Project Objectives and the four established Evaluation Criteria (Chapter 2, Sections 2.3.3 and 2.3.4).

The essential differences as compared to the proposed action are highlighted in the following statements.

- Only one of the alternative actions (conventional feedlot alternative) would create a commercial scale dairy operation in Hawai'i, with the capability to produce 10 percent of the State's fresh milk demand thus reducing dependence on imported milk (Objective 1). This alternative, however, would not reduce reliance on costly imported fertilizer and feed (Objective 2); grow local, quality grass as a primary feedstock (Objective 3); and would not utilize 100 percent of manure on site as nutrients to grow forage for dairy cows (Criterion 4).
- None of the alternatives would secure a dairy location that meets the requirements for a pastoral, pasture-based grazing dairy: sufficient contiguous land area; available long-term land tenure; adequate potable water supply; suitable soil properties; gentle slope conditions; and accessibility (Criterion 1).
- One alternative (Agricultural Park) could potentially generate new long-term employment in the agricultural sector on Kaua'i in a wide range of positions including pasture agronomy/soils science, environmental resources management (Criterion 2).
- The Agricultural Park alternative could also develop sustainable food production utilizing Important Agricultural Lands, demonstrating the importance of long-term agricultural leases and capital investment for agricultural infrastructure, water systems and support facilities. (Criterion 3). However, after years of trying, it appears there was limited interest in such a venture.

- Finally, addressing the range of potential environmental impacts (natural, cultural, social and economic) (Objective 8) the two alternative development scenarios would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.

In contrast to the other options considered, the planned agricultural operation of Hawai'i Dairy Farms, was determined to be the most viable option and is the preferred alternative. Of all the alternatives considered, this is the only approach that achieves project objectives and meets each of the four Evaluation Criteria.

- Hawai'i Dairy Farms will create a commercial scale pasture-based dairy operation in Hawai'i, with the capability to provide more than 1,000,000 gallons of the fresh milk demand, reducing dependence on imported milk (Objective 1).
- The planned dairy location meets the requirements of minimum land area, soil properties, slope conditions, water supply, land tenure and availability, and accessibility (Criterion 1).
- The planned action will generate new long-term employment in the agricultural sector on Kaua'i, including pasture agronomy/soils science, veterinary and animal husbandry, environmental resources management, milk/milk processing, and dairy business management (Criterion 2).
- Sustainable food production utilizing Important Agricultural Lands (Criterion 3) will occur with the proposed action, demonstrating the importance of long term agricultural leases, and the ability to draw capital investment for agricultural infrastructure including water systems and support facilities (Criterion 3).
- Address the range of potential environmental impacts by utilizing 100 percent of manure as natural fertilizer to grow the majority of food for cows (Criterion 4). The alternatives evaluated would generate fewer beneficial impacts and produce impacts that could potentially exceed those anticipated from the proposed project.
- Creating an economically viable pasture rotational-grazing model maintains agriculture, retains open space, and provides buffer between highly utilized resort and residential development and sensitive natural or cultural resources (Objective 8).

This response letter accompanies your copy of the Draft Environmental Impact Statement (EIS). The Draft EIS is available on the OEQC website at the following URL, search "Hawai'i Dairy Farms": http://tinyurl.com/OEQCKAUAI

Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

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