HAWAI'I DAIRY FARMS

~~DRAFT~~ FINAL ENVIRONMENTAL IMPACT STATEMENT

VOLUME ~~4~~ 9
COMMENTS AND RESPONSES TO THE EISPN - PART B

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

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FINAL ENVIRONMENTAL IMPACT STATEMENT
LIST OF VOLUMES

VOLUME

VOLUME 9
COMMENTS AND RESPONSES TO THE EISPN - PART B

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Consulted Parties				
Respondents and Distribution	**Early or Ongoing Consultation, Presentation, or Notification**	**Comments Received EISPN**	**Received DEIS**	**Comments Received DEIS**
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				
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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		

Individuals
(continued)

February 21, 2015

RECEIVED

MAR - 6 2015

GROUP 70 INTL

Attn: Laura McIntyre (808) 586-4337
State of Hawai'i, Department of Health
1250 Punchbowl Street,
Honolulu, HI 96813

State of Hawai'i, Department of Health
919 Ala Moana Blvd room 312
Honolulu, HI 96814
Laura McIntyre, Environmental Planning Office

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

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,

The following is my response and comment to the Hawaii Dairy Farms EISPN, posted on January 23rd, 2015. Each of the comments below need to be included and fully addressed by the Hawaii Dairy Farm EIS due to the substantial adverse environmental impact likely to be sustained if an Industrial Dairy is allowed to operate at Maha'ulepu on Kaua'i:

As all wildlife has what is known as a 'tolerance range,' once that range is exceeded the wildlife and threatened and endangered species may leave an area or die. Those amphibians that can't leave will die. For this reason each rare or endangered species, necessary habitat, mating behaviors, sensitivity to sound, sensitivity to methane gas, hydrogen sulfide, acid rain, and sensitivity light & glare, needs to be addressed in the EIS on an individual, per species, basis. The cumulative effect of all of these sensitivities on their survival as well as their potential inability to increase their numbers needs to be addressed. The necessary environment required to enhance the livability of our Federally threatened endangered species must be addressed in the EIS.

Specific Endangered birds

The native and endemic endangered birds known in the Maha'ulepu area are the Hawaiian Coot ('alae ki'oke'o), Common Moorhen ('alae'ula), Hawaiian Duck (Koloa), Hawaiian stilt (ae'o) and Hawaiian goose (nene). The impacts to each of these endangered birds need to be addressed separately in the EIS as each has its own nesting habits, food sources and environmental requirements .

Wetlands and Endangered birds

The Intermittent streams and wetlands at Maha'ulepu and Kipu Kai provide habitat for these endangered birds. The placement of a cow burial site near the edge of the HDF's property just adjacent to, and upland from, a known wetland needs to be addressed especially in light of the hydrologic interconnection of the valley, according to the Maha'ulepu, Island of Kaua'i Reconnaissance Survey (completed by the National Park Service, U.S. Dept. of the interior in 2008) on page 29. The 600+ dead cows that HDF needs to dispose of per year is an environmental threat to the wetlands and the endangered birds that live or frequent there. (Dead cow tally on record at the county council meeting in May 2014.) This significant adverse impact needs to be addressed in the EIS. The specifics of the method used and the value judgments made need to be disclosed by HDF to enable proper review of significant adverse impacts that may occur. Any manure or urine left on the paddocks that are upland of wetlands needs to be addressed in the EIS because of the possibility of runoff contaminating the wetlands with total nitrogen, ammonium nitrogen, nitrate and nitrite phosphorous, Enterococcus and hormones.

Waterbirds

Along the Māhāʻulepū watershed coastline, other small wetland ecosystems fed by rain and groundwater lie just inland of the dunes. These, too, attract native waterfowl; biologists believe they once supported larger populations, and have excellent restoration potential. Resource specialists told NPS that Māhāʻulepū and Kīpū Kai, in combination with Hulēʻia, provide a much-needed mosaic of varied wetland habitats that should to be reliably available for endangered Hawaiian waterbirds. (MIKRS) All wetlands small and large need to be individually identified in the EIS. Protection of these wetlands or potential wetlands needs to be addressed in the EIS. The specifics of the method used and the value judgments made need to be disclosed by HDF to enable proper review of significant adverse impacts that may occur.

Taro Patch and rain event

"According to a state source, nēnē, koloa and other waterfowl frequent the taro lease land in Māhāʻulepū valley, and a broad natural depression in the valley that fills with water after heavy rain draws many waterbirds. Sixty Koloa individuals were counted during one such event (Kaiakapu 2007)." (Page 19 MIKRS) The exact area of the "broad natural depression" needs to be determined and protected for the wild birds. The area of the depression needs to be established with the necessary fauna and flora to provide the bird's habitat. If the depression area has been disturbed by the grubbing and grading that occurred in 2014 by HDF, it needs to be restored. The specifics of the restoration need to be spelled out in the EIS. If the depression area is still viable then the area needs to be protected for the wild birds and named in the EIS. Any potential significant adverse impacts from dairy operation such as grazing, irrigation, herd movement, etc., must be addressed in the EIS. Additionally protection measures taken must be elucidated in the EIS.

Newell's Shearwater

Newell's Shearwater, a threatened native bird species, and nests on Ha'upu ridge, just above the dairy site (USFWS Recovery Plan for Newell's Shearwater). The fledglings leave their nests on Ha'upu ridge and fly towards the ocean directly over HDF's facilities. "Kauai is home to 90% of the total population of Shearwaters" (The bird that Darkened Kauai" by Coco Zickos).

"Transitioning to bird-friendly lighting at all county facilities has been one of our priorities, so we've budgeted for the retrofits for several years," Mayor Bernard Carvalho Jr. wrote in an email. "The new lights, Rapozo said, will be available seven days a week from 6 to 10 p.m. during 'non-fledgling season' — dates outside of the Shearwaters' fledgling season, which runs from Sept. 15 to Dec. 15. The systems at each facility include a push button to turn the lights on for an hour at a time and an alert system at the end of each hour that will warn users that the button needs to be pushed again for additional use. If the button is not pressed, the lights will turn off, which could save the county money on its electricity bill" (The Garden Island January 29th, 2015).

"The upgrades were one of the steps taken by the county to comply with a 2010 Justice Department plea agreement in which the county and Kauai Island Utility Cooperative admitted to violating the Migratory Bird Treaty Act. The charges, at the time, blamed the deaths of Newell's shearwaters on the lighting policies at county facilities. Officials said seabird fledglings can become confused by stray light during their first nocturnal flight from their nesting burrow to the sea. Some of these birds end up falling inland, where they can become prey for predators" (The Garden Island January 29th, 2015).

The Waste Management Plan for HDF submitted to the DOH states, "Rotary Milking System of 60 clusters that provides for a throughput of 360 cows every hour and allows for a maximum milking time of 6 hours approximately per milking and 12 hours per day." To accomplish milking the herd it will take approximately 12 hours. Additional time will be needed for cleaning out the facility and directing the waste to the effluent ponds, maintenance of equipment, to convey feed from 2 large silos to disc mill, and to take processed feed from mill to 904 feed system silo then to convey the feed to the feed shed. Additional time will be needed for delivery of grains to facility and maintenance of the feed system. These and many other processes will take beyond 12 hours per day. In fact, HDF at their public meeting in Lihue at KCC, on March 27th, 2014, stated that the milking would begin at 4am and go until 10am then start again at 4 pm, going until 10 pm. The issue here becomes many of these processes needing to be done at night and the lighting that would be needed. This will interfere with the migration of the shearwater fledglings to the ocean. The Migratory Bird Act comes into play here. The county stopped all games at the stadiums at night to comply. How will HDF comply when in fact there isn't enough daylight to run their operations? This

needs to be addressed in the EIS. The specifics of the method used and the value judgments made need to be disclosed by HDF to enable proper review of significant adverse impacts that may occur.

Migratory Birds

"Four migratory bird species that winter in Hawai'i and return to the Arctic to breed were noted in the study area." The Pacific Golden Plover, Ruddy Turnstone, Wandering Tattler and the Sanderling (MIKRS). There are additional migratory shorebirds that frequent the coastline occasionally, and other seabird species likely transit the coast. A State study notes that seabirds use the coastal sea cliffs and foothills for nesting and loafing (OSP 1992). The environmental requirements of these migratory birds need to be addressed in the EIS as well as the impact of the dairy's runoff, grey water, and predatory animals attracted by the dairy operation and the waste produced. The presence of rats and egrets, known to consume bird eggs, need to be addressed. Rats are currently having a substantial impact on the bird population in Koke'e. The State is also presently addressing a major rat infestation in Lehua, the Island adjacent to Ni'ihau. Steps to protect these birds from all adverse externalities need to be addressed in the EIS.
The cattle egret may consume the young of endemic waterbirds (USFWS 2005) and compete with native waterbirds for food (Hawaii Audubon Society 2005). The number of egrets attracted by 2,000 cows needs to be addressed in the EIS. Protection of food sources for waterbirds needs to be addressed in the EIS.

Native Species

Five native species are known to frequent the area: the Black Crowned Night Heron, White Tailed Tropicbird, Great Frigate bird, Wedge Tailed Shearwater, and Red Tailed Tropicbird. The Black Crowned Night Heron finds breeding habitat at Hulē'ia NWR and was spotted during the survey. Biologists describe Frigate bird sightings at Māhā'ulepū and on Mt. Hā'upu. (MIKRS) These birds, their special needs and what methods will ensure their survival need to elucidated in the EIS.

Terrestrial Invertebrates

Two notable and extremely rare terrestrial invertebrates live in the Maha'ulepu area: the Kaua'i Cave Wolf Spider (*Adelocosa anops*) and the Kaua'i Cave Amphipod (*Spelaeorchestia Hanamā'uluna*). In 2000, both the spider and the amphipod were Federally Listed by USFWS as endangered species. All known populations occur in the Kōloa basin on Kaua'i, within a 4-square-mile area (CBD 2007). Both species have been reduced to a few small populations; exact numbers remain unknown. Researchers say the spider is seen regularly in only one cave with a population of 16 to 28 individuals (USFWS 2005). The cave-laced corridor along the Māhā'ulepū coast of the study area, from Makawehi Point to Kawelikoa Point, is designated by USFWS as Critical Habitat for both of these endangered species. How is HDF going to protect their Critical Habitat from a deluge of manure laced water coming down the Waipili Stream and flooding the cave and vicinity during a rain event, tropical storm, or Hurricane? The cave floods from the rising waters of the Waiopili approximately every four years. This issue needs to be thoroughly addressed especially in light of the fact that Maha'ulepu Valley is hydrologically connected to the cave. (MIKRS)

The Marine Vertebrates

The beaches and near shore waters are home to three important large marine vertebrates: the endangered Hawaiian Monk Seal, known in Hawaiian as 'īlio holo ika uaua (*Monachus schauinslandi*), the endangered Humpback Whale or kohala (*Megapteranovaeangliae*), and the threatened Green Sea Turtle or honu (*Chelonia mydas).*

Successful Monk Seal puppings occurred at Maha'ulepu in 2000 and 2007 (MIKRS). Monk seal occurrences within the study area take on increasing significance as the overall population continues declining at about 4 percent each year. The updated Recovery Plan for the Hawaiian Monk Seal, released in August 2007, states that the species "is headed to extinction if urgent action is not taken." Its recovery strategy calls for actions to ensure continued growth of the Seal population in the main Hawaiian Islands (NOAA 2007b). Fast forward to February 2015, The Garden Island Newspaper states, "The Marine Conservation Institute is calling for the National Oceanic and Atmospheric Administration to 'redouble its efforts' to conserve and recover the endangered Hawaiian Monk Seal. 'Although NOAA's field staff has made progress on some fronts to protect and save the lives of individual seals, we think NOAA can — and must — do more to slow down and eventually reverse the decline,' MCI's Conservation Advisor William Chandler said during a teleconference Thursday. Despite continued efforts, the population of between 900 and 1,100 seals is declining at an annual

rate of 4 percent — a trend MCI estimates would halve the population in less than 20 years" The impact on Monk Seals due to rain events, tropical storms and hurricanes polluting the ocean via Waiopili stream with manure, urine, nitrogen, phosphorous, hormones and other fertilizers used by HDF needs to be address in the EIS.

Fish

The Reef Environmental Education Foundation recorded 24 species of fish at Kawailoa Bay (Māhāʻulepū), and 43 species at Kīpū Kai. An additional eight appeared in records kept by proprietors at Kīpū Kai. Kauaʻi residents describe the near shore waters of the study area as a "prime fishing area." Telltale pipes for holding fishing poles are embedded at favored sites along the shoreline. Fish abundance is also implied by the presence of monk seals—the seals feed on reef fish as well as octopus, lobster, and eel (MIKRS). The EIS needs to address how HDF will protect the fish species during rainy season, how the algae causing pollutants will be monitored and how the stream and ocean would be cleaned up. The EIS needs to address coral death caused by nutrients and algal blooms as coral is an intricate part of the environment. Climate change needs to be addressed in the EIS as the culminate effect of higher nitrogen and phosphorous levels in the waterways could cause faster algae blooms leading to rapid coral death.

Algae

"We saw no invasive or alien algae" (MIKRS). This is the condition of Maha'ulepu waters now, but in New Zealand it's a different story. "'Already choked with weeds and algae, waterways will get even worse as the dairy industry continues to boom,' the Environment Commissioner says. Poor-water quality is caused by the run-off of nutrients from farm land, which breeds invasive weeds, slime and potentially toxic algal blooms" (Waterways will get worse – Commissioner, article in NZFarmer.co.nz 2013). Nutrients, urine, manure entering the waterways and groundwater from runoff is likely because of the low Ksat of the two major clay soil types found on HDF site (Custom Soil Resources Report for Island of Kauai 2014) (CSRRIK). These issues need to be elucidated in the EIS. The likelihood of contamination of seaweed that is collected for human consumption needs to be addressed in the EIS.

Wetlands

The portion of Māhāʻulepū watershed that lies within the study area stretches from the Hāʻupu ridgeline southward through Māhāʻulepū valley and eastward to the coast. Agricultural operations began in the mid-1800's in Māhāʻulepū valley; its intermittent streams and wetlands were long ago modified for irrigation purposes. The landowner Grove Farm operates a water system that includes wells, ditches, tunnels and reservoirs. Māhāʻulepū Reservoir, at the back of the valley, is part of that system. Both it and the County-owned Puʻu Hi reservoir (at the very southern end of the study area) serve as important attractors for Hawaiʻi waterfowl.

A broad natural depression in the valley also fills with water after heavy rains and temporarily draws water birds in large numbers. Though Māhāʻulepū valley's streams and wetlands were modified, their remnants remain. These expand and become especially visible during wetter periods. The former Waiʻōpili Stream, largely subsumed by the ditch system within the cultivated area at Māhāʻulepū, emerges in more natural form near Makauwahi Cave at the south end of the study area, where it joins forces with a natural spring and a remnant of the once much larger Kapunakea Pond. This wetland juncture attracts waterbirds and serves as nursery habitat for native fish. It is linked hydrologically to the important Makauwahi Cave Reserve, a critical habitat for endangered arthropods that rely on seepage of nutrient-rich water (MIKRS).
Restoring and protection from cows, manure & urine polluted water of this large Wetland area needs to be addressed in the EIS. Protection of the two mentioned area reservoirs needs to be addressed in the EIS. Protection of the area around and in the broad natural depression needs to be addressed in the EIS.

Because all of Maha'ulepu valley is hydrologically linked to the Makauwahi Cave, any breaches of the effluent ponds have a likelihood of ending up in the cave from weather events, hurricanes, to tropical storms and flash flooding this needs to be addressed in the EIS. The feasibility and positive impacts to the environment of disconnecting the direct access of the irrigation ditches to the Waiopili stream and instead being processed as waste water prior to entering the stream needs to be addressed (Especially in light of the high bacteria counts and turbidity readings of the Waipili this last year- DOH & Surfrider).

We do not want the Waiopili stream to become like the New Zealand streams. "We also need to have a long-term vision about what sort of land use is appropriate according to the sensitivity of the receiving waters"(Waterways will get worse – Commissioner, article in NZFarmer.co.nz 2013). HDF's land use needs to be reconsidered in Maha'ulepu, an environmentally sensitive site, in the EIS.

Arthropods

Intensifying and adversely impacting land uses and activities poses current and potential threats to important natural and cultural resources within the study area. Kaua'i's endangered arthropods in the study area are especially vulnerable to impacts from quarrying and other activity on the marginal agricultural soils overlying their cave habitats. Grading, fill, and excavation result in disturbance, compaction or blockage of the subterranean cracks where these species find refuge during drought. Blocked areas break up the cave system into separate areas, isolating the already small populations and increasing their risk of extinction (MIKRS). The further endangering of the arthropods through grubbing and grading activities

Makauwahi Cave and Sinkhole

Makauwahi cave and sinkhole is equally important for the light it sheds on Hawai'i's human story. According to scientists working at the site, it contains "in a single stratigraphic sequence an encapsulated view of the full span of human occupation, including the millennia preceding human arrival, earliest human evidence, subsequent population increase and cultural change, European contact, and modern transformation" (Burney and Kikuchi 2006). Due to its neutral pH environment, Makauwahi's fossil and artifact finds are exceptionally well preserved. Its sinkhole walls surround an ordered column of sediment layers that tell a nearly unbroken tale of conditions on Kaua'i, from before the arrival of people through the changes wrought by a millennium of human activity. Researchers are piecing together new and detailed views of Kaua'i's past based on analysis of the Cave's sediments, combined with oral and archival sources (MIKRS). With the Cave's hydrological linking to the valley it would seem that cow urine would possibly change the pH of the water going into the Cave, thereby destroying all the perfectly preserved extinct life forms. The possibility of pH change and the impacts thereof need to be addressed in the EIS. An active sand quarry excavation operates adjacent to Makauwahi cave and sinkhole—so close that one small cave opening in the west sinkhole wall rises diagonally only about 50 feet before it ends in a surface collapse at the edge of the quarry (Burney and Kikuchi2006). Heavy equipment in use at the quarry can sometimes be felt within the cave environment, causing fear of potential rockfall or collapse. A heiau on the quarry site has already suffered significant damage. A future quarry site farther north at 'Āweoweo may potentially impact dune burials (MIKRS). The quarry on HDF's site needs to be addressed in the EIS for possible burial site as well as artifacts.

Invasive Alien Plant Species

Non-Native species dominate parts of the study area, and threaten or encroach on significant resources on the shoreline, at Hulē'ia, and on Hā'upu ridge. Once established, some of these aliens are difficult to remove. Ungulate disturbance destroys native vegetation, increases erosion, and provides fertile ground for invasive species (MIKRS). Cows could cause ungulate disturbances thereby increasing soil erosion and giving invasive species a foothold at the expense of the native species. This needs to be addressed in the EIS.

Weather Hazards

Environmental events such as hurricanes, fires, tsunamis and landslides are potential study area threats that can not only wreak direct havoc, but also set into motion long-term landscape changes, such as erosion and alien plant invasion, that gradually degrade and destroy native habitats. State officials report that two hurricanes in recent decades damaged the Newell's Shearwater habitat on Hā'upu ridge, and allowed invasive species to spread across newly-eroded slopes. Kīpū Kai representatives say the mountainsides above their valley were lushly vegetated before the hurricanes. By the time of the National Park Service (NPS) site visit, the slopes were bare and roamed by goats, and a small recent landslide was apparent on the upper part of the access road (MIKRS).

The entire study area shoreline is highly vulnerable to storms and hurricanes. Long-term coastal erosion hazard is high at Māhā'ulepū Beach and moderately high at Kawailoa Bay, Hā'ula, Kīpū Kai beaches, and the southern portion of

Niumalu (KC 2003). Potential tsunami hazard intensity is considered high along the Māhāʻulepū coast between Punahoa Point and Hāʻupu Bay, and at Long Beach in Kīpū Kai. These moderately sloped areas are also vulnerable to coastal stream flooding from seasonal rainfall (KC 2003). The EIS needs to address where and how the cows will be protected and or evacuated and the possibility that the cows will be swept into the ocean during a hurricane. The EIS needs to address what will happen to the manure that has been left on the fields near the stream that takes runoff from Ha'upu ridge and delivers it to the ocean. The EIS needs to consider the alternative of collecting the manure from the fields vs. the planned land application to minimize the threat to the environment. The EIS needs to address the possibility of using the collected field manure in methane gas generators/digesters to produce bio-gas energy.

HDF must prove that there will never be discharge of pollutants from direct surface runoff or ditch discharge into Waiopili stream as it courses directly into the ocean, and that percolation into both shallow and deep groundwater will not contaminate stream, estuarine and coastal waters, especially in light of the hydrologic linking of the valley, streams, aquifers and ocean.

Several state planning documents related to tourism, recreation, and historic trails emphasize the importance of recreational access and resource protection along this coast, especially in light of increasing public use (OSP 1992).

In 1992, Hawaiʻi 's Office of State Planning conducted a land use review that recognized Māhāʻulepū's "combination of outstanding coastal recreational areas, native coastal strand vegetation, significant physiographic, archaeological and scenic resources." Anticipating future development pressure, it said "measures will need to be taken to assure that the sensitive resources here will be protected." Suggested ways to achieve that protection include transfer of development rights and purchase of easements (OSP 1992). The possibility of transfer of development rights needs to be explored/addressed in the EIS.

NRCS Custom Soil Resource Report

On June 5th, 2014, the Natural Resource Conservation Service published a Custom Soil Resource Report focused specifically on the parcel of land intended for use by Hawaii Dairy Farms. The fact of this report, and its findings, was not referenced or included by Hawaii Dairy Farm's when submitting their current Waste Management Plan for approval to DOH (July 23rd, 2014). Since that filing, Hawaii Dairy Farms has never corrected this omission or explained their lack of any reference to this document or its findings. That omission must be corrected, and the NRCS findings need to be specifically addressed by the EIS.

The Custom Soil Resource Report states that, virtually all of the soils underlying the site have "very limited" capacity for disposal of manure through irrigation. The soils were also determined to be highly susceptible to surface water runoff. The study concluded that the soil types in the area have anywhere from "medium" to "very high" likelihood of surface runoff. The study further concluded that soil remediation on the scale necessary was not feasible.

Water

There are at least three County Wells (F, C, and D- in order of proximity) dangerously close to the proposed farm property that would be covered by planned land applied waste from grazing cattle as well as pumped de-sludged waste residue. These three wells provide the potable water for all of Poipu and most of Koloa. Well F, the nearest, is less than 750 ft. from Block H, a parcel specifically designated for receipt of pumped de-sludge residue. When this same area is actively grazed by cattle (HDF's Plan identifies specific grazing paddocks at this same site), there will be no less than 100,000 lbs of wet manure, and at least 6,000 gallons of urine applied to and left on this site each day. Unfortunately, this same area happens to contain some of the best draining soil of the farm site (as per NRCS Study and HDF's latest Plan). Consequently, the migration of both bacteria and harmful nitrates into the wells is a certainty. The EIS needs to establish how this can be prevented.

Conclusion

Not only does the EIS need to address the foregoing, but its EISPN is notably deficient in its proposal to consider Alternative Locations. In fact, HDF's idea of alternatives is to consider taking no further action at the proposed site, operating a CAFO at the same site, or finding one other potential site. If HDF approaches the EIS process using the methods commonly followed during an EIS process, alternatives should encompass consideration of more than one other location at

which their proposed plan could proceed if necessary. In this case however, HDF has predesigned a very limited alternative consideration and the single alternative site, not yet identified, is inadequate to satisfy the intent of the EIS process. It is interesting to note that when discussing the one alternative location in their EISPN, HDF states, "The micro-climate requires soil conditions favorable for nutrient absorption with access to a reasonable priced irrigation water source, to sustain nutritious grass pastures." The EIS needs to address how HDF could possibly proceed at Maha'ulepu when both the NRCS and their own Iowa Based Soil Study indicate that the soils there are anything but "favorable for nutrient absorption." HDF needs to solidly refute the obvious conclusion that the sensitive ecosystem of Maha'ulepu would be irreparably harmed if their Industrial Dairy is allowed to proceed as proposed.

Sincerely,

John (Jay) Kechloian
1722 Keoniloa Pl.
Koloa, HI 96756

GROUP 70
INTERNATIONAL

May 26, 2016

John (Jay) Kechloian
1722 Keoniloa 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 John (Jay) 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:

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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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.

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 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.

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

From: MaryLu Kelley <mkelley323@gmail.com>
Sent: Tuesday, February 17, 2015 4:02 PM
To: epo@doh.hawaii.gov; HDF
Subject: Comments on Hawaii Dairy Farm Draft EIS

Aloha,

I am very concerned about the proposed dairy at Mahaulepu.

I have lived in Lawai for the past 14 years and am a 27 year resident of Kauai. I plan to spend the rest of my life on Kauai.

I have some areas of concern that should be included in the Draft EIS.

I interested in being a consulted party for the draft EIS clear.

I am writing today to advocate for a thorough examination of:

waste management,

air and water quality protection,

herd growth triggers, cultural impacts,

alternative actions (**including alternative site selection**),

binding mitigation measures and

alternative agricultural uses.

From the base of Mount Ha'upu down to the beach, there exist many unmarked sites and burial grounds, as Hawaiians did not label grave sites. We do not know exact locations of many of these sites. I have to know that these sites will not be ruined. The EIS must include a thorough cultural resources study and provide measures to protect these resources.

The EIS must include extensive soil and hydrological information detailing the entire Maha`ulepu watershed, including the lava tube system, that can show with certainty that no nutrient of effluent run off will occur.

The EIS must examine potential water quality contamination threats for the drinking water and public health of Koloa/Poipu and address the response if such contamination occurs.

The EIS must include environmental indicators to determine whether the land and natural resources can support phase increases in herd size.

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.

The EIS must include an integrated pest management plan for fly control with intended biological, mechanical and potential pesticide measures.

Air quality monitoring has not been included in HDF's management plans and has been an un-addressed public concern since the dairy was posited. There must be testing done to ensure against the drifting of effluent smell into Poipu/Koloa.

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.

The EIS must include plans for site remediation for when the lease ends or 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?

Thank you for accepting my testimony.

Mary Lu Kelley

PO Box 289

Lawai, HI 96765

May 26, 2016

MaryLu Kelley
PO Box 289
Lawai, HI 96765
mkelley323@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 MaryLu Kelley:

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.

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.

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.

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.

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.

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

Frank & Marilyn Kelly
3566 Old Mill Place
Koloa, HI 96756

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

RE: Comments on Hawai'i Dairy Farms Environmental Impact Statement Preparation Notice, Dated January, 2015.

Dear Ms. McIntyre,

We have followed the notices regarding the proposed industrial dairy in Maha'ulepu Valley. Please accept these scoping comments of ours concerning Hawai'i Dairy Farm's (HDF) January, 2015 "Environmental Impact Statement Preparation Notice (EISPN). We apologise if our comments lack professional presentation or fail to cite scientific reports. We are local residents alarmed that such a project would even be proposed for Kauai, much less the environmentally and culturally sensitive (and environmentally unsuitable) Mahau'lepu Valley.

1. The Proposed Dairy Would Significantly Impact Important Cultural Sites and Resources.

Mahau'lepua is a traditional Hawaiian ahupua'a running from the Ha'upu mountain range to the shoreline on Kauai's southest shore. Natural and cultural resources in this area have been identified which hold significance for the native Hawaiian population. The area also provides significant recreational and enjoyment opportunities for the general population. Please make sure these are thoroughly identified and the probable detrimental impact evaluated in the EIS.

2. The Proposed Dairy would curtail the beneficial uses of the Maha'ulepu Valley, beach and surroundings.

Please consider the potentially affected activities: hiking, hunting, fishing, gathering, bird and animal watching, nature walks, photography, surfing, snorkeling, paddleboarding, and scuba.

When the raw waste water runoff eventually reaches the coastline, irreparable environmental damage will occur affecting the marine offshore reefs and ecosystem.

3. Wrong soil for the proposed dairy operation.

This is where the entire proposal appears to falter. The HDF site is 60% composed of soils identified as "poorly drained". If the soil cannot accommodate water absorption, where will the manure from 699 and eventually 2000 dairy cows end? In the local stream, the drinking water wells for Kauai and then the ocean. The DOH recently revised its cesspool regulations out of concern for the water quality throughout Hawaii. Why should HDF be allowed to accumulate the equivalent of 411,000 people's waste daily above ground on 517 acres? The population of Kauai is less than 70,000. An independent soil evaluation and its impact must be undertaken.

4. Economic impacts.

Hyatt Hotels and Resorts is likely the largest employer on Kauai. The Poipu resort area accounts for 25% of the tourist activity on Kauai. An entomologist, employed by the State of California on vacation in Poipu, estimated the fly population in the Maha'ulepu Valley area would expand by approximately 3-5 billion, yes Billion, shortly after the dairy herd reaches 2000. 517 acres covered if wet manure most of the time. Ideal fly breeding! Then there's the smell. Would you pay to vacation in an area prone to being downwind of 250,000 pounds of manure daily? The waters will no longer be pristine, but subject to terrible periodic runoff pollution. The State of Hawaii and the County of Kauai will suffer a dramatic loss of revenue if the HDF is allowed to proceed. Please address these issues in detail.

Sincerely,

Frank Kelly

Frank Kelly

Marilyn Kelly

Marilyn Kelly

GROUP 70 INTERNATIONAL

May 26, 2016

Frank and Marilyn Kelly
3566 Old Mill 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 Frank and Marilyn Kelly:

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.

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: McIntyre, Laura
To: HDF
Subject: FW: South Shore Dairy EIS
Date: Monday, February 23, 2015 2:18:56 PM

fyi

-----Original Message-----
From: fishyfishy@hawaii.rr.com [mailto:fishyfishy@hawaii.rr.com]
Sent: Friday, February 20, 2015 9:36 AM
To: EPO
Subject: South Shore Dairy EIS

Aloha Ladies and Gentlemen,
Just a few words from a local since the early 70's. Just a bit concerned with the run-offs from heavy rains that might effect tourist industry downstream and also flies/smells associated with dairy farming. As with most businesses being good neighbors, a great attitude to take is will my business affect anyone else's. Just as in trying to control the dust that farming entails, can a business control the smells associated with this business? Its all about location and I think dairy farming in a tourist environment/area is not a good mix. Its like building a nuclear power plant next to a hospital and claiming that nothing will happen, so help me god. Ever try eating breakfast/lunch or dinner next to a field of cows?? A must try in an EIS test. Aloha Ken

May 26, 2016

Ken (no last name)
fishyfishy@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 Ken:

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.

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.

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.

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

February 22, 2015

Sinclair W. Kinsey
[illegible]9 Prospect Ave.
Hood River, Oregon 97031

State of Hawaii
DOH
Attn.: Laura McIntyre
1250 Punchbowl Street
Honolulu, HI 96813

Subject: Hawaii Dairy Farms, Maha'ulepu

Dear Ms. McIntyre

For the last fifteen years my wife and I have been annual visitors to Kauai and in that time have gotten to know the island well and are fortunate to have met many wonderful people and have made friends. Many times we have gone to Maha'ulepu and with every visit we are struck by this unique natural wonder.

Kauai is not our full-time residence and as such I feel I'm not qualified to address every resource that would be adversely affected by HDF's proposal. However, we live in a town situated in the Columbia River Gorge National Scenic Area, so we have an intimate connection to an outstanding and protected landscape. Also, we often visit the north coast of Oregon, driving through and near the town of Tillamook, known for its dairy farms and cheese production. Although the dairy industry there is ubiquitous and is an important segment of the local economy, these operations are not near the 82.5 cows per acre intensity of HDF's proposal. One impact that is certain to all who live in or near Tillamook or have visited the area is the foul smell emanating from these farms which most of the time is intense and onerous.

There is no doubt in my mind that the prevailing Trade Winds out of the northeast would bring a stench to the Poi'pu area and beyond that would impact all who live and visit there. The detrimental effects to the resort and tourist businesses in the area would be heinous.

Maha'ulepu is a striking landscape that is rich in scenic, natural and cultural resources that deserve consideration for protection. It is my hope that a third party lands trust will facilitate the purchase of the entire property to be held and protected in perpetuity.

Thank you.

Sincerely,

Sinclair W. Kinsey

Sinclair W. Kinsey

Cc.: Hawaii Dairy Farms, LLC; Group 70 International, Inc.

GROUP 70
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Hitoshi Hida AIA

May 26, 2016

Sinclair W. Kinsey
209 Prospect Avenue
Hood River, OR 97031

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 Sinclair W. Kinsey:

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.

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

Group 70 International
Attn: Jeff Overton, HDF Project
925 Bethel St. 5th Floor
Honolulu, Hi 96813

Dear Mr. Overton,

I have been a resident of Koloa for over 42 years and Maha`ulepu has been a special place for my family in all of those years. I share the concerns of the community regarding the environmental and cultural impacts of an industrial dairy in Maha`ulepu valley. However, The Hawaii Environmental Policy Act also refers to economic effects, including adverse effects, in Chapter 2.7. I hope the EIS will address the soundness of the Hawaii Dairy Farm as a business. Please consider and realistically assign cost to all the expenses involved in this project and assess the expected return (earnings from milk). Perhaps assign a high and low figure to both the expense and revenue to more accurately analyze the profitability of the HDF venture.

I would like to know what happens when the dairy fails and goes out of business. The environment will have suffered drastic assault by then, including the construction of buildings, holding ponds filled with manure, gates and pens and other infrastructure. How can this damage be mitigated? Is HDF willing to set u a remediation fund to return the site to its natural state?

The EIS must include satisfactory answers to the above questions as well as accurate answers to questions on air quality, soil, hydrology and protection of cultural sites.

Please include me as a consulting party for the draft EIS.

Sincerely,

Marty Kuala

Marty Kuala
P. O. Box 785/ 5481 Emi Rd.
Koloa, Hawaii 96756
Kuala@aloha.net
742 - 7393

-----Original Message-----
From: Marty Kuala [mailto:kuala@aloha.net]
Sent: Friday, February 20, 2015 1:34 PM
To: EPO
Subject: EIS comments; attn. Laura McInyre

Your message is ready to be sent with the following file or link attachments:

Environmental Planning Office

Note: To protect against computer viruses, e-mail programs may prevent sending or receiving certain types of file attachments. Check your e-mail security settings to determine how attachments are handled.

Environmental Planning Office
Attention: Laura McIntyre
919 Ala Moana Blvd.
Honolulu, Hawaii 96814

Dear Ms. McIntyre,

I have been a resident of Koloa for over 42 years and Maha`ulepu has been a special place for my family for all of those years. I share the concerns with my community regarding the environmental impacts an industrial dairy will have on the Maha`ulepu valley and surrounding streams and ocean. Of particular interest to the Department of Health the EIS should provide accurate answers to:

- Ground water contamination – although the holding ponds will be lined with plastic the paddocks where the cows graze will not and manure and urine will seep into the soil and into the streams and wells from which Koloa derives its fresh water.
- Soil and hydrology information for the entire Maha`ulepu watershed including the lava tube system showing that no effluent run off can occur.
- Air quality and pest control has not been addressed in the HDF plan. The negative health effects from odor, biting flies, etc. should be dealt with in depth in the EIS.
- Remediation and mitigation plans if the dairy fails and goes out of business. Effluent ponds left open and uncirculating and flies and other pests left uncontrolled will pose a serious health hazard that the State should not have to remedy. HDF should set aside a fund for this expense.

Please include me as a consulting party in the draft EIS.

Mahalo,

Marty Kuala
P.O.Box 785/5481 Emi Rd
Koloa, Hawaii 96756
kuala@aloha.net / 808-742-7393

GROUP 70 INTERNATIONAL

May 26, 2016

Marty Kuala
P.O.Box 785 / 5481 Emi Rd
Koloa, Hawaii 96756
kuala@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 Marty Kuala:

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.

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.

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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-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.

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 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 Kauaʻiʻs 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 Hawaiʻiʻs 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.

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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 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: **Steve Lauryn** lauryn@koamoon.com
Subject: Fwd: Letter of Public Response Regarding Hawaii Dairy Farms' EIS for Maha'ulepu Site
Date: February 15, 2015 at 9:57 PM
To: State of Hawaii Dept. of Health

RECEIVED
FEB 19 2015
GROUP 70 INTL

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

Subject: Letter of Public Response Regarding Hawaii Dairy Farms' EIS for Maha'ulepu Site
Date: 2/15/2015

To Whom It May Concern:

The American Public Health Association called for a nationwide moratorium on CAFOs [concentrated animal feeding operations, including industrial dairies] in 2003, citing compelling scientific evidence of public health concerns related to CAFOs. A prestigious 2008 commission funded by the Pew Charitable Trust a nonprofit organization committed to rigorous, analytical and evidence-based work to inform public policy, concluded:

"The current industrial farm animal production system often poses unacceptable risks to public health, the environment and the welfare of the animals… the negative effects of the system are too great and the scientific evidence is too strong to ignore."

– APHA, "PRECAUTIONARY MORATORIUM ... ANIMAL FEEDING OPERATIONS," 2003
– apha.org/legislative policy

I am a businessman on Kauai with both a business and a home in Poipu. I have had a business in Poipu for 17 years. My home is located approximately three miles downwind of the proposed dairy farm site (HDF) in Mahaulepu.

It is my understanding that the folks at HDF (Hawaii Dairy Farms) are under the impression that our local community stands in support of this industrial dairy operation. I'm here to tell you that nothing could be further from the truth. Just come to one of our community meetings and you'll see the numbers of people—business owners, shopkeepers, restaurateurs, homeowners, property managers and citizens of all stripe: They're positively horrified at the prospect of this project going forward.

Let me stress, as so many have tried to before, that the majority of folks I have contact with are not opposed to a responsibly planned—environmentally sustainable--dairy farm on Kauai. However I, and many like myself, adamantly oppose HDF's patently poor choice: to plan a large, industrial dairy project (beginning with 600 cows but increasing to 2,000) in a spot which is so important to the area's natural resources, sacred Hawaiian and archeological sites, vital visitor industry, homes, our drinking wells, our air, our streams and beaches.

A glance at a map of our island reminds you the majority of the population on Kauai dwells at or near the coastline. Relatively vast expanses of open land are available mauka of where we humans live, work and play. Why in the world put an industrial dairy so close to and upwind (and upland) of such an important and populated area? Unless perhaps the answer is that it serves the purpose and financial interests of a few people who will likely never be vested in this community, nor possibly even set foot in it, except maybe to collect the revenues.

I am disturbed by the potential amount of manure such an operation can produce (using HDF's own figures) and the sustainability over time to the environment (soils, groundwater, our nearby wells, streams, beaches and reefs—with regard to nitrates, phosphorous, antibiotics, potential pathogens, etc.) based of the methods by which HDF proposes to deal with the waste product their operation will produce. I do not feel that this amount of waste in such an area, given the nature of the soils and the site's location upland of the beaches and nearby coastline is in any way balanced by the amount of useful product (milk) to be generated. I do not believe that the amount of waste generated in such a concentrated area can be efficiently and sufficiently absorbed and processed by the soils in the manner which HDF proposes.

I am disturbed by the potential—proven in many, many rural areas throught the U.S. and elsewhere—for storage tank and berm spills, and accidents which can be excacerbated or precipitated by natural events such as hurricanes, flooding, reservoir breaches and heavy rainfall (events which I have witnessed many times in my 27 years on Kauai).

I am disturbed by the all too likely effects of all of the above to our quality of life, our livelihoods, my own business, the investment I have made in my home and family here in Poipu, my health and that of my wife and daughter and neighbors.

I am disturbed by the potential amount of stench and flies an operation of this size WILL generate, and the effect it will have on my quality of life and my business--which depends heavily on the Grand Hyatt Kauai, the Point at Poipu, Poipu Kai and Kiahuna for customers. If their bookings go down, we suffer.

I have done extensive reading and research on water quality in the U.S. related to large dairies of the kind proposed by HDF, in Iowa, Washington State, California, Wisconsin, Missouri and Pennsylvania--and there is a clear record of increased pollutants in both surface and groundwater, not to mention a record of violations, spills and fines in these areas.

I sincerely hope you will take these things into account in your efforts to conduct a thorough and impartial EIS.

And I thank you for your efforts and attention.

Sincerely,

Steven Lauryn & Ming Lan Lauryn

Steven Lauryn
2279 Loke Rd.
Koloa (Poipu), HI 96756

May 26, 2016

Steven Lauryn
2279 Loke Road
Koloa, HI 96756
lauryn@koamoon.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 Steven Lauryn:

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.

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.

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-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 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

To: 2/23/15

Group 70 International Inc.

925 Bethel St. 5th Floor

Honolulu, Hawaii 96813

RECEIVED
FEB 24 2015
GROUP 70 INTL

From:

Debra Lee-Jackson

PO Box 662201

Lihue, Hawaii 96766

Aloha Mai Kakou,

These comments are in regard to the EIS for Hawaii Dairy Farms LLC's proposed dairy farm in Mahaulepu.

I live on Kuleana land in Huleia. I farm taro there just as my ancestors have done for hundreds of years.

*The Huleia River is completely cut off just above Halfway Bridge. 100% of that water is illegally diverted to Waita Reservoir in Koloa. Not one drop of water exists for about 100' or more past the diversion. There is not enough flow in the river to sufficiently water the taro in Huleia. The oopu, opae and hihiwai are negatively affected by the reduced flow. The working of the ecosystem is severely diminished. For this reason, the dairy cannot draw water from the Waita Reservoir.

*The Mahaulepu aquifier cannot be drawn from or there will not be enough drinking water.

*Mahaulepu has many sacred Hawaiian sites. Any form of non traditional use is a desecration.

*Mahaulepu has many traditional fishing sites. Effluent will destroy the safe use of the ocean.

*My appurtenant, riparian and Hawaiian Rights are being tread upon at an alarming rate.

The proposed dairy in Mahaulepu will negatively impact appurtenant, riparian and Hawaiian rights. These are my comments.

Aunty Debbie

huleiafarm@gmail.com

*Sources available upon request.

May 26, 2016

Debra Lee-Jackson
P.O. Box 662201
Lihue, HI 96766
huleiafarm@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 Debra Lee-Jackson:

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.

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.

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

Aloha, Mr. Jeff Overton

I have been a homeowner at Poipu Kai for the past three decades, where I lived with my children and soon to be grandchild. I am, as well as my friends, neighbors and clients, are very concerned that the quality of our lives will be greatly diminished if we are forced to live near the proposed Industrial Dairy. A dairy with 2,000 cows or less creates **many** environmental concerns for the residents of the South Shore including contamination to our drinking water, hazardous airborne pollutants, the horrific smell of HDF fecal and urine waste for the residents living downwind from this dairy. The winds do change in Hawaii so this WILL be a problem. Let us not overlook the potential source of disease transmission due to rodents, mosquitoes and masses of biting flies. The added noise pollution and traffic are also concerns.

It is my belief as a Realtor is that this will destroy our/my real estate property values. Many of my clients buy properties for vacation homes and this will greatly impact their rental revenues. Let us not overlook the harm it will have on the threatened native endangered species. HDF has the potential to destroy the quality of our coastal recreational lifestyle that we as Hawaiian residents and tourists enjoy. The historical significance and cultural resources along the Maha'ulepu coast will be lost to us and our future generations.

Why would we as residents of Kauai allow this dairy the misuse of this beautiful, unique and precious land? Why would we destroy our income and the millions of dollars generated by the tourist industry for the sake of this horrific dairy? Why would tourists want to come back to Poipu? **We need to address these concerns and get answers through the EIS.**

Mahalo,
Susan Leininger

www.alohagvr.com

Susan Leininger, RS
(808) 645-0859
GREAT VACATION
RETREATS

GROUP 70
INTERNATIONAL

May 26, 2016

Susan Leininger
2426 Linaka Street
Koloa, HI 96756
(808) 645-0859

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 Susan Leininger:

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.

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 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.

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.

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 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.

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: Joan Levy
To: HDF; laura.mcintyre@doh.hawaii.gov
Subject: Objecting to dairy at mahal eps
Date: Tuesday, February 24, 2015 10:07:13 PM

I am a kauai resident for the last 23 years, living in Kapaa. Even tho my home property will not be directly affected by the negative environmental impacts of the proposed dairy in Koloa, I believe the areas addressed in what follows do concern me as a resident of Kauai.

I have spoken with several New Zealanders who echo'd the commentary below in terms of the negative environmental effects outweighing any potential economic gain.

This dairy is a bad idea for the good of Kauai and must not be allowed here.

Regardless a comprehensive EIS must be performed by agents having nothing at all to do with proponents for the dairy.

I have borrowed the following concerns from a local friend of mine who has clearly articulated the issues:

Impartial Studies: One of my first concerns is that the EIS be conducted by a non-partial independent research firm, not an architectural design company already vested in the project. Since there is a current conflict of interest, another firm should be chosen to conduct the EIS. Alternately, the research and reporting consultants should be selected by agreement with other interested parties, DOH and Friends of Mahaulepu.

Location: The Mahaluepu location does not seem to meet the needs for soil absorption or water supply, as referenced in section 3.1.3 of the plan. Soil studies show it is mostly clay. The status of previously diverted Waipakewaters has not been determined. An alternate location should be found.

Regulation: Referring the EIS Preparation Notice, concerning DOH regulatory reviews at the bottom of p. 2-2 in section 2.3: The 699 cows are all pregnant, producing milk, so how long before the first calf is born and the herd exceeds the existing permits? A Waste Management plan for a large CAFO should be required for review for the EIS.

Public Health Issues: The bottom of page 3-3 states there are no existing hazardous elements, however the current measured Waiopili stream pollution levels are hazardous. These independent TestAmerica results are available to the public at the friendsofmahaulepu.org website
and Surfrider organization. Enterococcus bacteria for the summer sampling is 514/100 ml for Gillin'sbeach and 8880/100 ml for Waiopili Stream, dangerously above State standards (35). The yearly average from 19 samples of
the Waiopili Stream is 9,100, a constant source of pollution into the ocean. If significant data was omitted, can we count on complete accuracy of an EIS report by the same methods of the same company? How can the nearby wells be protected? Groundwater studies indicate the wells will become polluted. The risk to the entire Koloa fresh water supply is extremely high with the plan to pump thousands of pounds of manure sludge from the collection pond down slope to Block H, nearest

the wells. Nitrate toxicity will also result from storm runoff.

Degradation of Enveironmental Quality: The proposed Dairy site can be seen from the roof of my house, which is about 2 miles downwind. We are already affected by winds carrying the GMO chemicals from the same area. The smell of cow manure and flies would also be carried by the strong winds so common to this area. Unlike the Moloaa dairy in summer, where one could drive by and hold your nose temporarily, we will not be able to escape the smell from a Mahaluepu dairy operating 24-7 all year.

Environmental and Economic Welfare, Cumulative Effect:
Major properties, such as the Hyatt resort, are already planning to sell if the Dairy comes in, which would start the de-escalation of property values, thathave not yet recovered from the previous economic crisis. Based on the information presented in the HDF plan, and documented New Zealand studies, where the climate is more temperate, major pollution is predictable. Our warmer climate, clay soil and slopes will accelerate the process of manure, nitrates and phosphates into the ocean. The NRCS Custom Soil Resource Report Review indicates that the amount of waste cannot be absorbed by these soils. The polluted ocean, flies and odor would keep everyone from enjoying any outdoor activities at the beaches, shoreline, and our own yards.

The Dairy effect on jobs and tax revenue will never compensate for the job loss at resorts, and the loss of tourism dollars. A major resort reports cancellations already due to news of the future Dairy. All of us depend on tourism, one way or another. I believe that shoreline conservation is something we have a right to protect for all and for the future of Kauai. In particular, a Dairy at this location, only 1 mile upstream, causing waste to flow into the westerly current just east of our most popular major beach resorts, would negatively impact the entire Kauai economy. This project has been advertized as a sustainable project. It is not. The milk will not be processed and stay here on Kauai. Livestock is the most inefficient use of agricultural land for food production. The methane produced by cows far outweighs all other energy conservation methods for Kauai. The methane destruction of the ozone layer, reported as significant over New Zealand, will mean a hotter, dryer climate for Kauai with future draught conditions. Recovery of the climate and the economy would be impossible.

Sincerely,

Joan Levy, kapaa resident, POB 160, Kapaa, 96746

Sent from Joan Levy on my iPad

GROUP 70 INTERNATIONAL

May 26, 2016

Joan Levy
P.O.Box 160
Kapaa, HI 96746
kauaibliss@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 Joan Levy:

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.

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-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 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

From: Karl Lo <cath.khylo@icloud.com>
Sent: Friday, February 20, 2015 5:49 PM
To: HDF; Environmental Planning Office
Subject: Hawai'i Dairy Farms' EIS
Attachments: HawaiiDairyFarms.pdf

Karl & Catherine Lo
P. O. Box 887
Koloa, HI 96756
(808) 742-7238
cath.khylo@icloud.com
Website:
http://www.htcelebration.org/poemswithoutborders

February 20, 2015

Dear Sir or Madam:

As kamaaina residents of the South Shore of Kaua`i and supporters of Malama Maha`ulepu, we are compelled to share with you our concerns about the establishment of a dairy at Maha`ulepu Valley.

The question that comes up time and again is: Couldn't the dairy be situated elsewhere away from homes, beaches and resorts?

Our concerns are based on experience, not fear. We remember Waimea Dairy, which in more recent years was owned by Meadow Gold Dairies. From the Westside, Meadow Gold moved to the North Shore and operated a dairy in Moloa`a until 2000. Unpleasant odors during visits to the Westside and North Shore always assaulted our olfactory organs as we approached and passed the dairies.

Remembrance of the dairies always bring back memories of noxious odors. Cow manure is cow manure is cow manure! They all have very unpleasant, harmful and poisonous fumes that pollute the environment and the air we breathe and compromise human comfort and well-being. Also, cow manure is breeding ground of bacteria and viruses that can cause disease making public health a concern.

With the diary located so close to the ocean, it's hard to convince the community that dairy waste will not create in some way runoff that will pollute Kawailoa Bay. Also, swimming and picnicking at Kawailoa Beach, fishing at Black Mountain, walking along the shore and enjoying a leisurely day at Maha`ulepu may become the joys of yesteryears with the dairy taking over the valley.

Equally important to us as supporter of Malama Maha`ulepu is our concern that a dairy at this pristine valley will destroy the natural, cultural and historical heritage for which Maha`ulepu is appreciated and loved by residents and visitors alike.

Malama Maha`ulepu's mission is to take care of Maha`ulepu, educate the public about it and preserve it for future generations. The question is: Is Hawai`i Dairy Farms putting an end to this mission?

In closing, we urge Hawai`i Farms Dairy to find another site for the dairy.

Mahalo and Aloha,

Karl & Catherine Lo
P. O. Box 887
Koloa, HI 96756
Tel.: (808) 742-7237
Email: cpl123@hawaiiantel.net

May 26, 2016

Karl & Catherine Lo
cath.khylo@icloud.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 Karl & Catherine Lo:

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.

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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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.

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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

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: PAUL LUCAS Organization:

Preferred contact Method

Email: SOLAR EC@MAC.com Postal Address:

Phone: (Optional)

Comments: The proposed DAIry FArm up-wind And up-water from the most pristene Beach Area in the world is the most ridiculous plAn ever proposed for the Island.
Whoever came up with this idea and whom ever support it are controlled only by money. this project does not provide food or Sostainability that it say it does.
OUR Tourist industry is at risk From this Crazy proposAL. The stench from this industry lofting into the popu area is reasone only to CAN this project! The crap from these Cows will eventually end up in the ocean.

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

Paul Lucas
solarec@mac.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 Paul Lucas:

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.

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.

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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: dragonflydesignshawaii@gmail.com
Sent: Sunday, February 22, 2015 2:39 PM
To: HDF
Cc: epo@doh.hawai.gov
Subject: concerning Hawaii Dairy Farms at Maha'ulepu, Kauai

How will you stop run-off into the ocean when you are so close to the water?
What clean up measures are you prepared to undertake when pollution does occur?
Maha'ulepu has been used for agriculture in ancient times, but not the intensive grazing of dairy cows on unnatural terrain.
Why not locate on the Highway side of Haupu ridge where cattle has already been grazed on lush grasslands and the animals would be cooler?
Do you even care about the animals or just the money in your pocket?
Why not organic free range cows? This farm would be a source of pride for the people of Kauai, the only organic dairy farm in Hawaii, and we'd all be healthier drinking organic milk.
How will you prevent the pollution of the marshland where the Nene nest?
sincerely,
Christina Lynam

Sent from Windows Mail

GROUP 70 INTERNATIONAL

May 26, 2016

Christina Lynam
dragonflydesignshawaii@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 Christina Lynam:

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.

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 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

From: Sandy Macdougall
To: epo@doh.hawaii.gov
Cc: HDF
Subject: Fwd: Hawaii Dairy Farms
Date: Monday, February 23, 2015 9:26:45 AM

Please consider the following as my comment, to be included in the record, on the proposed EIS of Hawai'i Dairy Farms.

---------- Forwarded message ----------
From: Sandy Macdougall <sandymacdougalll@gmail.com>
Date: Sun, 22 Feb 2015 15:31:05 -0700
Subject: Hawaii Dairy Farms
To: bbuley@thegardenisland.com

Dear Editor:

I am a visitor - a retired Colorado water lawyer - with some experience in ground water pollution - both as proponent and opponent of projects in Colorado.

Reading about the "Hawaii Dairy Farms" disputes raised my concern for Poipu area residents because of the close proximity of drinking water sources and the proposed confined animal feeding paddocks and waste management facilities.

I have not yet found any articles about the dangers of nitrate contamination of groundwater. Nitrates are a natural part of urine and fecal material - both animal and human.

Ingestion of nitrates in drinking water by infant mammals (humans and animals) can cause low oxygen levels in blood, and potentially death (aka "blue baby syndrome).

Once nitrate concentration gets into an aquifer, it is extremely difficult to mitigate.

Treatment of nitrate in wastewater is possible, but expensive, and not always effective.
The best practice is to avoid contamination of drinking water.

I recommend that State and County officials and residents exercise special caution when considering any proposal which could increase nitrate in drinking water - such as Hawaii Dairy Farms' Mahaulepu proposal.

M.E. "Sandy" MacDougall, temporarily (and yearly) at Sunset Kahili, Poipu.

May 26, 2016

Sandy Macdougall
sandymacdougalll@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 Sandy Macdougall:

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-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.

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 Inc
925 Bethel St, 5th Floor
Honolulu, Hi 96813

13 Feb, 2015

To whom it may concern,

We are owners of a condo in Poipu Kai Resort. Our address is 2371 Ho'ohu Road, MN 609. We are part time residents spending 6 months of the year on Kauai. We rent our condo through Great Vacation Retreats for the rest of the year.

We have serious concerns about HDF's proposed dairy farm at Mahaulepo. We join our voices to the vast numbers who are concerned about the impact this dairy would have on our community. We want to be clear that we are stake holders who feel our economic viability, health and ability to enjoy fresh water and air will be threatened if this proposal is allowed to go forward. The proximity of the farm (1000 ft) to wells that provide our drinking water is unacceptable. The size and location of the proposed farm so near to important environmentally sensitive areas is unconscionable.

We have walked, hiked and enjoyed the beaches near this proposed dairy. We have delighted in seeing the endangered monk seals basking in the sun protected by volunteers who teach us about protecting our oceans for these endangered species. We discovered Makauwahi Cave and enjoyed the wonderful tours informing us of its wonderful archeological significance. It broke our hearts to hear that the Waiopili Stream flowing by the cave into the ocean is one of, if not, the most polluted steams in the State of Hawaii. As we understand it, the reasons for this are not fully understood but it is suspected that a few wild pigs in the area may be a contributing factor. Work on the proposed dairy site may be another. We suggest that it makes no sense at all for further development to take place in this area which has proven to be very sensitive and poses challenges to our environment without the addition of 2000 cattle dumping upwards of 200,000 lbs of solid waste and 16,000 gallons of urine a day into an already environmentally threatened area.

We have concerns that the proposed site will not be able to sustain the growth in grass required to feed the cattle in question. Overcrowding and insufficient nutrients is a concern for the animals as well as the community. The lack of covering will have a disastrous impact on the area. Disease, black flies and stench are reported extensively in other parts of the US and the rest of the world where industrial dairy farms have been located in highly sensitive areas.
The Mahaulepo area was extensively studied by the National Park Service and was found to be hydrologically linked to the Waiopili Stream which drains directly into the ocean at Mahaulepo beach. Because of the watershed and the water distribution at Mahaulepo, what goes on to the ground there will most assuredly find its way into the ground water impacting the quality of our drinking water. What reaches the shores of Mahaulepo will find its way in rapid order to the shores of Poipu where the economic fallout for businesses and tourists will be a disaster..

The Mahaulepo area was extensively studied by the National Park Service and was found to be hydrologically linked to the Waiopili Stream which drains directly into the ocean at Mahaulepo beach. Because of the watershed and the water distribution at Mahaulepo, what goes on to the ground there will most assuredly find its way into the ground water impacting the quality of our

drinking water. What reaches the shores of Mahaulepo will find its way in rapid order to the shores of Poipu where the economic fallout for businesses and tourists will be a disaster.

HDF states that they will be self contained and that they pose little threat to the environment. We have read nothing to alleviate our fears and believe the science available proves the opposite is true. The relocation of this dairy farm away from the coast and important tourist destinations seems the only acceptable solution. We trust that you will ensure that no industrial dairy will be built at Mahaulepo. This decision will not only impact the quality of our community today but will be a legacy of tough but sound environmental policy that will positively impact future generations on Kauai.

Thank you for your attention to this matter,

Stuart and Lynne Maple

GROUP 70 INTERNATIONAL

May 26, 2016

Stuart & Lynne Maple
2371 Ho'ohu Road, #609
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 Stuart & Lynne Maple:

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.

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.

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

From: marem@aloha.net
Sent: Saturday, February 21, 2015 1:31 PM
To: HDF; epo@doh.hawaii.gov
Subject: HDF Testimony

Aloha HDF and EPO,

I am a resident of Kauai and would like my comments to be considered regarding the Dairy Farm in Poipu.

Location: Maha'ulepu is one of the most scenic and untouched places left on the island. The State spends lots of money marketing Poipu as an upscale sunny destination. I don't feel a Dairy Farm is suitable in this area. Isn't there another site better suited for a Dairy Farm? It will do great harm to the island's economy if the East side of Poipu becomes known as the stinky side of Poipu. Haven't we been focusing on developing and promoting the cultural aspect of Old Koloa Town and Poipu?

Smell: I am very familiar with farms, and Dairy Farms are impossible to breath around. When I visit friends on the mainland, both grass fed and feed lot farms are problematic. I hold my breath for over 4 miles when driving by them.

Rain: I have been through some wild rain seasons, 40 days and 40 nights one year. Even relatively small storms create brown water run off for days. I have deep concerns about run off from a Dairy Farm. Additionally, I have volunteered for school children outings in the beautiful Maha'ulepu area. Kauai has precious underground water near the Maha'ulepu Sink Hole. It is of utmost concern that Kauai cares for and protects this sacred area.

Sustainability: I believe there was a Dairy Farm on Kauai that is no longer running. Why did that Dairy Farm shut down? If we can process the milk on Kauai, how will it be profitable or sustainable if we have to ship the milk off island?

Gestation: I realize the dairy cows must be pregnant in order to lactate. How long is the gestation period for Dairy Cows and what is done with all the off-spring? 600 Dairy Cows = 600 Calves. In short order won't the cow population increase significantly?

I hope you can address our concerns. Once you establish a Dairy Farm, it will be very difficult to turn back and repair any unforeseen damages.

Sincerely

Marianne Martin
2167B Kelikoli Street
Lihue, Hawaii 96766

GROUP 70 INTERNATIONAL

May 26, 2016

Marianne Martin
2167B Kelikoli Street
Lihue, HI 96766
marem@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 Marianne Martin:

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.

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 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

February 21, 2015

RECEIVED

FEB 25 2015

GROUP 70 INTL

Attn: Laura McIntyre (808) 586-4337
State of Hawai'i, Department of Health
1250 Punchbowl Street,
Honolulu, HI 96813

State of Hawai'i, Department of Health
919 Ala Moana Blvd room 312
Honolulu, HI 96814
Laura McIntyre, Environmental Planning Office

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

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,

The following is my response and comment to the Hawaii Dairy Farms EISPN, posted on January 23rd, 2015. Each of the comments below need to be included and fully addressed by the Hawaii Dairy Farm EIS due to the substantial adverse environmental impact likely to be sustained if an Industrial Dairy is allowed to operate at Maha'ulepu on Kaua'i:

There are at least three County Wells (F, C, and D- in order of proximity) dangerously close to the proposed farm property that would be covered by planned land applied waste from grazing cattle as well as pumped de-sludged waste residue. These three wells provide the potable water for all of Poipu and most of Koloa. Well F, the nearest, is less than 750 ft. from Block H, a parcel specifically designated for receipt of pumped de-sludge residue. When this same area is actively grazed by cattle (HDF's Plan identifies specific grazing paddocks at
this same site), there will be no less than 100,000 lbs of wet manure, and at least 6,000 gallons of urine applied to and left on this site each day.

Unfortunately, this same area happens to contain some of the best draining soil of the farm site (as per NRCS Study and HDF's latest Plan). Consequently, the migration of both bacteria and harmful nitrates into the wells is a certainty. The EIS needs to establish how this can be prevented.

Conclusion Not only does the EIS need to address the foregoing, but its EISPN is notably deficient in its proposal to consider Alternative Locations. In fact, HDF's idea of alternatives is to consider taking no further action at the proposed site, operating a CAFO at the same site, or finding one other potential site. If HDF approaches the EIS process using the methods commonly followed during an EIS process, alternatives should encompass consideration of more than one other location at
which their proposed plan could proceed if necessary.

In this case however, HDF has predesigned a very limited alternative consideration and the single alternative site, not yet identified, is inadequate to satisfy the intent of the EIS process. It is interesting to note that when discussing the one alternative location in their EISPN, HDF states, "The micro-climate requires soil conditions favorable for nutrient absorption with access to a reasonable priced irrigation water source, to sustain nutritious grass pastures." The EIS needs to address how HDF could possibly proceed at Maha'ulepu when both the NRCS and their own Iowa Based Soil Study indicate that the soils there are anything but "favorable for nutrient absorption." HDF needs to solidly refute the obvious conclusion that the sensitive ecosystem of Maha'ulepu would be irreparably harmed if their Industrial Dairy is allowed to proceed as proposed.

Sincerely,

Deborah Masters
P.O. Box 238
Koloa, HI 96756

GROUP 70
INTERNATIONAL

May 26, 2016

Jeff and Deborah Masters
P.O. Box 238
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 Jeff and Deborah Masters:

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.

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.

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

-----Original Message-----
From: Candy McCaslin [mailto:cmccaloha@gmail.com]
Sent: Monday, February 23, 2015 5:32 PM
To: EPO
Subject: Mahalepuu

Mahalepuu
There are so many negative factors involving the proposed Dairy Farm on Grove Farm land in Poipu that it is hard to just pick out the worst. The whole tenor of this this is negative and the performance at Koloa School shows how wrong and how foreign this company is for Kauai. They have no idea of Kauai Style. Bringing security people, refusing questions that are not pre-approved, and basically just presenting a marketing campaign.
However, what is so discouraging to me is that the DOH is allowing a fake EIS from these people. It is not a legitimate EIS as it is being done by the same people on the payroll who are designing the project. The DOH is not supposed to be a political arm of the government, but one that protects the island's people. Yet, they fail again & again to do that. One example is that although volunteer organizations constantly test our local waters and find them polluted, the DOH often finds no pollution. Who do we believe? Now, because our mayor is development oriented, and unfortunately, the governor I voted for also seems to be going that way, we can expect them to approve this phony EIS. Dr. Bal, you have done so much for Kauai - please do not let these intruders ruin a very precious resource. Please insist this billionaire not call the propaganda they are working on a legitimate EIS.
They say they are doing it voluntarily, so I guess that justifies their doing it in-house so to speak.
If they were attempting to do the right thing, they would go thru mediation and have the mediator choose an unbiased company to prepare a legitimate EIS. As was done with the GMO folks.
Money talks and we the people believe politicians all have their hands out. Billionaires can get whatever they want. How sad for our Nani Kauai.
Candace McCaslin

Sent from my iPad

GROUP 70
INTERNATIONAL

May 26, 2016

Candace McCaslin
cmccaloha@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 Candace McCaslin:

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.

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.

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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: Sharon McCoubrey
To: HDF; epo@doh.hawaii.gov
Subject: Homeowners say "NO" to dairy
Date: Monday, February 23, 2015 2:30:02 PM
Attachments: Scanned_Image.pdf

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 McCoubrey Organization: Homeowner - Poipu Kai

Preferred contact Method

Email: srmccoubrey@me.com Postal Address: PO Box 607 Koloa 96756

Phone: (Optional)

Comments: Why was this meeting necessary?
All of the information needed was available to anyone who reads the paper or listens to the concerns of the local people. You really didn't know?
An easy solution would be to simply move the location to an area more suited to the dairy. Easy to do!
To consider this location as sacred Hawaiian ground is an insult to all who put high value on the land.
As a homeowner, your plans stink! Paddle the pur

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

Sharon McCoubrey
P.O. Box 607
Koloa, HI 96756
srmccoubrey@me.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 McCoubrey:

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.

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

1901 Poipu Road, K714
Koloa, HI 96756
February 10, 2015

RECEIVED
FEB 11 2015
GROUP 70 INTL

Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, HI 96813

Placing The Hawaii Dairy Farm on Mahaulepu will greatly affect the economic and social welfare of the Poipu community:

Substantially affects the economic or social welfare of the community or State;
Substantially affects public health;
Curtails the range of beneficial uses of the environment (for plants, animals, or humans);
Involves a substantial degradation of environmental quality;
Detrimentally affects air or water quality or ambient noise levels;

HDF's EISPN does not cover how the Dairy Farm will prevent the overwhelming stench of the urine and feces of 2,000 cows, carried by the trade winds, from engulfing the Poipu community. Nor do they address how they will prevent the massive numbers of biting flies that accompany said herd from multiplying and biting people in the vicinity of Mahaulepu and Poipu.

We live in Poipu Kai. We will not be able to open our windows because of the terrible smell. We will not want to walk outside due to the smell and biting flies. We will not invite our relatives and guests from the mainland to visit us anymore as Poipu will be a place to avoid. Our property values will plunge.

We moved here in 2010 to retire in paradise. No longer will Poipu be paradise. Tourists will not come here, thus many jobs will be no longer needed, from the housekeeping staffs to the restaurants and hotels.

Indeed, placing The Hawaii Dairy Farm on Mahaulepu will greatly affect the economic and social welfare of the Poipu community. The concerns I have cited need to be addressed in the EIS.

Sincerely,

Ellen F. Meboe

May 26, 2016

Ellen F. Meboe
1901 Poipu Road, K714
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 Ellen F. Meboe:

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

1901 Poipu Road, K714
Koloa, HI 96756
February 19, 2015

RECEIVED

FEB 20 2015

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We moved here in 2010 to retire in paradise. No longer will Poipu be paradise. Tourists will not come here, thus many jobs will be no longer needed, from the housekeeping staffs to the restaurants and hotels.

Indeed, placing The Hawaii Dairy Farm on Mahaulepu will greatly affect the economic and social welfare of the Poipu community. The concerns I have cited need to be addressed in the EIS.

Sincerely,

Joseph A. Meboe

Joe Meboe

GROUP 70 INTERNATIONAL

May 26, 2016

Joe Meboe
1901 Poipu Road, K714
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 Joe Meboe:

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:

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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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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

Group 70 International

Attn: Jeff Overton, HDF Project

925 Bethel St., 5th Floor

Honolulu, HI 96813

Dear Jeff Overton,

Thank you for the opportunity to comment on the HDF EIS Preparation Notice.

There are a number of concerns we urge you to address in the EIS. They are elaborated below and in the attached PDF.

The beneficial uses of the environment could be severely curtailed. Low impact, recreational uses of the coastline and waters of Maha'ulepu are already degraded to the point that fishing and swimming in or near the Waiopili Stream is ill advised for health reasons. Pollution of the rest of valley's waterways and coastal shore must be prevented to ensure that future generations can continue to enjoy recreational use.

How would just the presence of the dairy – haul trucks, noise, flies – be a disincentive to recreational use of the beaches? "Serenity" is a key word locals and visitors use to explain the effect of this place.

Environmental preservation is an end in its own right. Damaging runoff from poor containment and drainage would change the ecological balance of the area, damaging ecosystems, including reefs offshore. Hard data along with rigorous analysis must assure that even a statistically rare climatological event will not expose the area to harm.

How would the construction of a dairy impact other future beneficial uses of this environment, such as organic, or pesticide-free crops, which could be brought to local markets by local farmers. Would any negative environmental impacts of air, soil, water, be limited to the borders of the dairy? How? When dairy operations cease and all structures are removed, how will the site be returned to its pre-dairy condition?

Interest in the culture, history and prehistory of Kauai has led to some remarkable restoration projects – the Kaneiolouma Heiau Complex and Makauwahi Cave Reserve are 2 examples. To what extent might this dairy permanently destroy (at worst) or be a disincentive (at best) to scholarly, historical and archeological exploration and restoration of this area in which a substantial native population lived, fought and died? A community benefits from knowing its history and heritage. The EIS should include any known examples of private commercial/industrical enterprises within or in proximity to similarly fragile environmental and historical places which successfully became educational and cultural destinations. Would future funders be inclined to invest in restoration efforts in, under and around a dairy farm?

How will water quantity and quality in Poipu and Koloa be affected by the high volume of use of this resource and the dairy's proximity to wells and other water sources for local consumption?

How would ANY negative environmental impact reverberate on the tourist industry, property values, overall quality of life of south shore neighbors? An EIS must ensure that ANY negative impact in these

areas be mitigated. If mitigation is not possible, the project must not be allowed to advance. The EIS must include ALL factors not only from the beginning stated 699-head dairy but at full build-out.

Thank you for your attention to these issues.

We would like to be a consulting party, informed as the EIS process goes forward.

Ira and Rayme Meyer
Frequent users of Maha'ulepu.
Po'ipu Homeowners since 1986
1660 Pe'e Road, Koloa 96756
rayme_meyer@hotmail.com
irameyer@hotmail.com

GROUP 70
INTERNATIONAL

May 26, 2016

Ira & Rayme Meyer
1660 Pe'e Road
Koloa, HI 96756
rayme_meyer@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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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.

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 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 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 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 Kauaʻiʻs 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 Hawaiʻiʻs 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 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

FEB 18 2015

State Of Hawaii

Department of Health

1250 Punchbowl Street

Honolulu , Hawaii 96813

Attention : Laura McIntyre

Our family owns a home in Poipu on the Island of Kauai . We are very much opposed to having a commercial dairy in our area . My family has operated commercial daries in California for most of our lives . We speak from experience that daries generate too much waste to deal with , too many biting flies , and an unpleasant odor , to expect tourists to visit Poipu ever .

Our family loves to spearfish . S.C.U.B.A. dive and swim in the waters here . The run-off from the waste would put an end to our activies here .Please don't let a dairy ruin our lovely life here .

The John W. Miller Family

1870 Hoone Road

Koloa , Kauai , Hawaii 96756

1

GROUP 70 INTERNATIONAL

May 26, 2016

John W. Miller
1870 Hoone 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 W. Miller:

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.

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.

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.

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).

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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.

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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.

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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

5 Pages

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.

(1)

NOTE: Submitted comments will be published in the Draft EIS

COMMENT

Name: Mary P Mills Organization: Business Owner Since 1982 Imported 35yr Resident

Preferred contact Method

Email:

Postal Address: PO Box 1256 Have lived Kalaheo, Hi 96741 Worked in Poipu Hi Koloa, Hi

Phone: (Optional)

Comments: Is this HDF Not in a flood zone? What happens when the next tsunami - Warning or Tsunami Comes to your workers - Cows - Chemicals - debris? We have had at least 4 warnings that I remember One specifically Fri March 11, 2011 getting at 4th warning at 3:28 A.M that a Tsunami coming in 1½ TO 1 HR later from my Concerned Nephew in ill. How will you? What will you do to "Ho'o makaukau" (get Ready)? Heaven help us when the next one that hurricane comes it is "inevitable" The SHARKS will have their grass Feel field day. and the other (people) of us be left with more Contaminated dead water than we do now. Founded by - Testing - Sea Founders Foundation. I have lived on Kauai 31 yrs a South shore "Wahine" a Business owner Since Nov 1, 1982. Worked all over the island in outdoor places Craft Fairs

Continued

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

RECEIVED

FEB 24 2015

GROUP 70 INTL

ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE

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2. to provide written comment regarding effects of the proposed action.

(2) Continued

NOTE: Submitted comments will be published in the Draft EIS

COMMENT

Name: Mary P Mills Organization: _____

Preferred contact Method

Email: Postal Address:

Phone: (Optional)

Comments: I left Kauai with tears in my eyes to live on mainland for 10 months after Hurricane INIKI - I was out of Business 09-11-1992 at Spouting Horn park - the road was washed away took that long to rebuild - Returned to Kauai July 1993 - Could Not afford living on Kauai - Before my rent was $300 a month Rent - After Rent was $1,500 to $2,000 a month so I moved to Maui - Took 4 yrs Rent to Decrease Returned 1997. I also Survived Hurricane IWA "Piercing Winds" 11-23-1982 - But my house that I rented on Hoono Rd. Kala, Hi for $260 a month - Now Rents for $8,500.00 a Week - and my 23 Day Business (Flowers) went in the Ocean - Not a flower on the island - Kauai Whole island was Brown Not Green I evacuated 5 HR Notice 7 A.M - Eye coming 1:00 p.m & Came 3:00 P.M - (Continued)

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

(3)

I evacuated to Wai Wai Track - Poipu Not far from HDF Proposal not sure I was far enough away. my friends had told me to go Far away from Ocean 750 ft is to close for comfort. It was devasting in that area people injured - flying - Covering Debrieu. It is "invetable" It will happen again.

Only a few will be able to get thru the Tree Tunnel "Malahia Rd" I was blocked for ~~only~~ 1 to 2 Hrs last year 2014 for the Marathon. In my 31 years I had never seen The Tree Tunnel with people trying to leave poipu the Road was bumper-To bumber from Before Brvelye - to Beginning of Tunnel. I had to laugh - But it was so scary to think what is going to happen.

What about flooding? Our drinking Water? On Kauai the wetest spot on earth I have experienced 73 days of Rain Nite and Day in a "Row" Jan 1988 - March 23, 1988 "It Rained" in Poipu Koloa, Hawaii. Some few years ago 2007-08? We had another 40 Day Biblical Rain in a Row It rained & Windy in Poipu. So even though we are in a drought now, it means "We the people" need Drinking clean Water. It does not belong to Grove Farm

How, What, When will you do to control the smell, chemicals you use in the air? What about the flies and insects?
Feb 14, 2014 I attended a Non-Profit Org Craft Fair "Life Bridges" sponsored Malama Pono fair out doors at Mano Kalanipo Park, Poipu. The winds were 35-50 SWest mph. Things were flying everywhere - Tents & all - Had heavy rain with storm. The smell will kill the visitor industry - Make people sick. Effect the economy - devalue properties - When Ke Kahua O Kaneiolouma just increased the value of property.
We need to protect the "aina the land with properties to benefit us in the long run: not short time profit
Do you not care HDF about the 30 endangered species? from spiders - Birds - Owls to sea creatures - fish to eat - Whales
Runoff - sub-surface - What do you plan to do? The whales will be "There she Blows" to "There she goes".
The most important & last significant for last. The most important is the people Hawaiian Traditional, Culturally impact. How will you protect the petroglyph from flooding - Burial sites there &?

Why doesn't HDF Relocate? Trade land with Grove Farm to another area? Lease land out to so Small Farmers - Grow more Taro, Soil not perfect for 699 pregnant Cows to keep multiplying.
This project is making for NO Milk for Kauai will be Devastating
Please God help us all!
I'm so grateful & Blessed that I live on this Jewel in the middle of the sea & to be able to say I got to have & Love experienced true island living before all the unjust growth that has happened since 1878 - & 1980 for Me
All of This needs to be addressed in the HED & EIS - Take Me back to my little grass Shack!
Mahalo,
Aloha
Mary P Mills

WITH GOD ALL THINGS ARE POSSIBLE
Matthew 19:26

If GOD is for us, Who can be against us?
Romans 8:31

May 26, 2016

Mary P. Mills
P.O. Box 1256
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 Mary P. Mills:

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.

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.

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

FEB 25 2015

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: Imogene Miner Organization:

Preferred contact Method

Email: Postal Address: 2211-B Pane Rd. Koloa, HI 96756

Phone: (Optional) (808) 742-4797

Comments:

I have lived on the South shore of Kauai for thirty years and have loved the area known as Maha'ulepu. To use this beautiful land for an industrial Dairy is a travisty. I have read the materials presented by HDF as well as the many citizens who oppose the dairy and have come to the conclusion that it doesn't make sense – environmentally or economically. Big money and big egos are clearly behind it.

I hope DOH will do the right thing for the environment, public health and people of Kauai.

Imogene A. Miner

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

Imogene Miner
2211-B Pane 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 Imogene Miner:

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 Kaua'i 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 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

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: Lance C. Mizumoto Organization: Hawaiian Culture

Preferred contact Method

Email: Postal Address:

Phone: (Optional) 808-652-8550

Comments: My main concern is to keep our land clean. Mainly our ocean. I am a dedicated fisherman to Hawaiian net throwing. So our main source of sustenance is from the sea. So therefore it is a "bear necessity" to keep our ocean from getting any type of contamination. We need to preserve all of our Hawaiian sea food Tika Vanah (Black Urchin), Opihi (Limpets), Ahukihuki (Purple Urchin), Tako (Octopuss), Pipipi + Leepeepe (Black Sea Snail), Limo (Seaweed), Ogo (Seaweed), Lepua (Seaweed), Ama Ama (Black Crab) + ALL OF THE HAWAIIN REEF FISH. MAHALO AND ALOHA

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

Lance C. Mizumoto

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 Lance C. Mizumoto:

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

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: Yuri Montgomery Organization: Concerned Citizen

Preferred contact Method

Email: y.montgomery@comcast.net. Postal Address: 2211 B Pane Rd. Koloa, Kauai

Phone: (Optional) (808)742-6688

Comments: The HDF proposed dairy of up to 2000 cows in Maha'ulepu is environmentally, economically, and culturally a bad idea.

The EIS must address potential and real effects on: 1) Drinking water 2) ground water 3) streams, irrigation ditches, 4) Beach and ocean health 5) odors 6) flies 7) wildlife 8) home values 9) Tourist & business sustainabilet, 10) 11) noise, 12) traffic 13) cumulative effects over time in all the areas listed above.

The EIS must also address other location options on Kauai and ~~other~~ off island

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

Yuri Montgomery
2211 B Pane Road
Koloa, HI 96756
y.montgomery@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 Yuri Montgomery:

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.

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.

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 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 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 Kauaʻiʻs 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 Hawaiʻiʻs 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 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

From: f lee morey
To: HDF; laura.mcintyre@doh.hawaii.gov
Subject: Hawai"i Dairy Farm at Maha"ulepu
Date: Monday, February 23, 2015 9:30:23 PM

I have had the opportunity to meet with several different Council people over the past year to ask, "What are you thinking?" in allowing a dairy or any industrial farm use of land right next to our most treasured beaches and Kauai's most visited resort area. Their reply has always been that it was a legal use of agricultural land. "Legal" does not make it smart, equitable, clean, or good planning for Kauai's future.

I personally lived in Kekaha for many years with the Waimea Dairy operating approximately two miles away and you could smell the small number of cows kept there. You were also constantly fighting huge flies that made their home at the dairy and visited the neighboring area all too frequently.

Kauai needs forward thinkers. Representation that has vision and can put together a future for this island with reason and good sense. You already have all the reasons it is a terrible idea to locate a Dairy next to a population base much less a resort area. The owner of the company is not living next to or on the dairy, he is living on the north shore where his real estate and land holdings will not be impacted by odor and bacteria in the water.

There are other places to locate this dairy that would not negatively impact Poipu. Why are those areas not being considered? Is the County going to gain infrastructure from this development? After Poipu property values are negatively impacted by this fiasco they are going to have to figure out where to next get those lost property taxes.

Personally, I think cows are great but I also grew up on a farm and I know that cows, particularly in the numbers planned, can create a hazardous environment. This is not BS. You already know these cows should not be located near a resort area, or a culturally sensitive area or a water shed or a beach or any coastal waters.

If the calculation that 2,000 cows will produce the same amount of waste as generated by 328,800 humans is true, and I believe it is. You had better consider moving the dairy much farther inland. Consider the impact of cesspools that would service 328,800 people concentrated in the area where the dairy is proposed. It's all about priorities, if you don't save the environment there will be no one around to drink the milk.

Lee Morey

GROUP 70
INTERNATIONAL

May 26, 2016

Lee Morey
f.leemorey@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 Lee Morey:

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.

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

RECEIVED

FEB 23 2015

RESPONSE TO HAWAII DAIRY FARM'S ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE

GROUP 70 INTL

Dear Sir, Ma'am,

I am terribly disturbed on many levels by the threat of an Industrial Dairy at Maha'ulepu Valley. The imminent damage to this unique pristine island physically, culturally, and economically cannot help but be disastrous. I definitely support farming on the island but absolutely not an Industrial Diary with unprecedented number of cows per grazing acre in a culturally sensitive, unique and wonderful Oceanside Valley. I fully support small dairy farms. I grew up on a dairy farm building to 100 milking cows plus calves, a few hogs , horses and chickens while growing all of our hay, corn, wheat and vegetables on 370 acres. It was truly an organic farm which my family struggled for years to build.

AT age 21, my uncle died from a bacterial infection contracted when he drank from a stream that ran through one of our pastures. This is still a very vivid memory for our family and I can't believe that Grove Farm refuses 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 . In my mind, and as a tax payer, it is almost criminal that our State Department of Health also refuses to post a sign about this known bacterial contamination. Hopefully Grove Farm and the State Department of Health have deep pockets .

In my reading of the EISPN, it does not, but should include a detailed study of the known pollution with identification of it's cause and method 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 environment without the obvious risks occurring at Mahaulepu.

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 accepted by HDF or the Department of Health. We will wait and watch for the results of that study.

I also have vivid memories of the difficult days on the farm when it rained a lot and the smell of the manure was intolerable. Or (overwhelming) How will Kauai Dairy Farm eliminate that horrible smell?- It is not possible to do so. Any traveler will attest that the smell travels for miles and miles. Islanders remember Meadow Gold's 400 herd dairy farm in Moloa. Their run off including the ground water under the road polluted Moloa Bay causing the State Health Department to close it down.

I clearly remember the cows crying while birthing and the incessant flies in our home and the Nasty, Nasty insect bites that never subsided. My brothers and sisters and I grew up with a fly swatter in our hands. Often these bite sites would fester and infect. Now that I am older, I realize that but for the healthy hard working life on the farm, these bites might have made us much sicker. As it is, the five of us did suffer from bouts of impetigo. I cringe at the thought of what is likely to happen with resident and visitor children who would not have the acquired immunity from growing up with these biting insects. None of the 5 of us children wanted to continue our farm. I know full well that our experience will pale in comparison to the threat of this dairy farm, polluting, the streams, the ocean/beaches along the south shore, our 3 water wells -- 1 of which is less than 750 feet from the most well draining part of the land, where you plan to pump the sludge from the pond that had been collected from the floor of the milking parlor. Speaking of one of the terrible effects of ocean contamination,, The Manure in the water , with the direction of the wind and ocean stream, will be trapped in the Childrens' Swimming Area of Poipu Beach Park, the best toddler ocean pool in Hawaii which is part of Poipu Beach, voted the No. 1 Beach in the United States and always along with Hanelei in the top Ten. What were you thinking? Please consider other more isolated locations for the sake of all Kauaians. Go to plan C or D or E. This plan will be a disaster.

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 prove that the fly population can be sufficiently abated to assure that visitors to Mahalulepu and the south shore will not be sickened from bites from these flies.. As any entomologist will confirm , and as I experienced growing up, 1 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 their proliferation and these flies fly up to 4 miles from the site. Within a few months, there will be billions of files. What facts will your EIS offer as proof that this will not happen? Please hire the best environmental entomologist available for your study who is not affliliated with International 70.

The EIS needs to provide proof as to how the HDF will stop the "Run OFF". Gravity operates at even a small pitch (definitely over clay) and this land is only 65 feet above sea level. You are sloping the land to the ditches to encourage control of the run off but 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, What facts can you give us as to how you will reduce the Nitrates in the water and the methane gas contribution to our fragile Ozone layer. You study must also address these issues.

There will be no more eating on our lanais, thriving outdoor restaurants or picnics on the beach. Bankrupcy of restaurants and businesses and condos will follow as most of us can not afford air conditioning and will need to Give Up our retirement dreams. Unemployment will be rampant as the economy of the entire island gradually declines from loss of jobs related to our disappearing Visitor Industry. In return you are offering maybe a dozen "filthy jobs" for locals . Bottom line is – your goal is to take the "'gold" and leave us the "poop". Why not STOP Now and Look for a suitable location and a lower dairy cow to acre ratio. It will save everyone a great deal of pain and money and would give our young people hope that THEY TOO will have a future on this God Given Island of Kauai.

Ian Muller
PO Box 1575 Koloa, HI 96756

May 26, 2016

Jan Muller
P.O. Box 1575
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 Jan Muller:

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.

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.

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.

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SURFACE WATER

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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 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.

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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.

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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; (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

2363 Puu Rd., Apt 1D
Kalaheo, HI 96741
Thursday, February 12, 2015

State of Hawaii, Dept. of Health, Att: Laura McIntyre, &
Group 70 International, Inc., &
Hawaii Dairy Farms, LLC, Att: Jeff Overton

RECEIVED
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GROUP 70 INTL

Re: Response to HDF's Environmental Impact Statement Preparation Notice

Dear Sirs/Ma'am:

This letter is my response to Hawaii Dairy Farm's Environmental Impact Statement Preparation Notice. My concerns with Hawaii Dairy Farm proposals are manifold, but this letter will focus on only one concern; water pollution.

Water pollution is not addressed sufficiently by HDF's EIS Preparation Notice. HDF could affect water quality detrimentally to the point where it is no longer fit for consumption. HDF states drinking water and irrigation water supply for HDF, and ground water quality will be addressed in the Draft EIS. This is not sufficient. Scientific examination shows that the clay-based soil of Maha'ulepu will not absorb cattle urine runoff in the quantities that will be produced.

What can be done about unlawful water pollution at Maha'ulepu? After the water becomes polluted, it will remain polluted for a long time. Who pays for the cleanup of this unlawful water pollution? Certainly not Hawaii Dairy Farm. Their corporate structure is an LLC, and as such, their liability is limited. Will they indemnify the County for any cleanup expense? Probably not. The obvious answer is the residents of Kauai must pay for any cleanup, if a cleanup is even possible.

There is no way that unlawful water pollution at Maha'ulepu can be avoided after the introduction of 2000 cows or even 699 cows. Please prevent the HDF rape of Maha'ulepu.

Respectfully Submitted,

John T Muller Jr

May 26, 2016

John T. Jr. Muller
2363 Puu Road, Apt 1D
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 John T. Jr. Muller:

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.

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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.

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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).

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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

COMMENT

Name: Kathleen Murguia Organization: Lifetime Resident

Preferred contact Method

Email: Postal Address: P.O. Box 1723 Koloa, Kauai, Hi. 96756

Phone: (Optional)

Comments: 699 "pregnant" cows? That's another 699 when each cow has a calf. And More to come? Talk about a can crammed with sardines.... This is so much more worse than anything immagineable..... All waste from the cows are to remain on site... WHAT?? Soil at Mahaulepu is very limited to absorb waste. Run-offs because of that goes where? Ocean, streams, maybe even the water walls that supply the Koloa-Poipu area.

I was born + raised in Koloa, been here almost 64 years. Gone are the days of family picnics & just plain ole good times at Mahaulepu. And you want to ruin what's left with a dairy farm. All I can say is SHAME ON YOU!! Keeping Kauai, what's left of it, is all the people ask. Keep Mahaulepu just the way it is. Don't let it disappear in the blink of an eye. To do so, would take away the character of what Kauai is all about. NO to the 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
epo@doh.hawaii.gov

Deadline: February 23, 2015

GROUP 70 INTERNATIONAL

May 26, 2016

Kathleen Murguia
P.O. Box 1723
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 Kathleen Murguia:

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 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.

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

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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 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

From: Mary Neudorffer
To: epo@doh.hawaii.gov; HDF
Subject: M Neudorffer Comments on Hawaii Dairy Farms" Draft EIS Preparation
Date: Monday, February 23, 2015 2:06:32 PM
Attachments: M Neudorffer Comments on Draft EIS Prep.pdf

State of Hawaii, Department of Health February 23, 2015

Environmental Planning Office.

Attention: Laura McIntyre

919 Ala Moana Blvd., Room 312

Honolulu, HI 96814

Group 70 International

Attn: Jeff Overton, HDF Project

925 Bethel St., 5th Floor

Honolulu, HI 96813

SUBJECT: Comments on Hawaii Dairy Farms' EIS Prep Notice from Mary Neudorffer

Aloha Laura McIntyre and Jeff Overton,

I wish to be a consultant party for the draft EIS.

I have been living in Po'ipu, Koloa, for more than 14 years. I love to visit Maha'ulepu to hike, swim, spend the day, and generally enjoy the beauty, the fresh air and the peacefulness of this open, undeveloped area.

I am concerned about the impacts of the proposed dairy on Maha'ulepu, Po'ipu, Koloa and the other south shore areas and on the preservation of our enjoyment of such a special place as Maha'ulepu.

Specific points that I believe need to be addressed in the draft EIS are as follows:

1. The EIS needs to set forth environmental impact monitoring with criteria for actions including possible closure of the dairy when certain criteria are exceeded. Actions should include requirements for impact mitigation; alternative operational planning, including when to cease operations; and restoration of the areas impacted. The EIS needs to identify which environmental monitoring, criteria, and actions proposed would be binding and enforced and how any changes to this would be vetted with concerned parties.

2. The EIS needs to show how the public will be kept informed of environmental impact monitoring results.

3. The EIS needs to show how the range of beneficial uses of the Maha'ulepu area and the south shore surrounding areas will not be impacted by the dairy especially via water, smell, sounds, and access.

4. The EIS needs to address environmental and usage impacts using realistic range of scenarios, not just averages. For example, it is realistic to expect during the life of the dairy that there will be one or more hurricanes like Iniki and Ewa; sporadic very heavy rains like the 42 days of constant rain a few years ago, where the ground was thoroughly saturated; heavy winds; and increasing temperature highs and lows like the record highs and lows we are now getting.

5. When evaluating impacts on flora, fauna and the coastal waters and ocean resources, the EIS needs to take into account seasonal variations and the kind of climate extremes we have here on the south shore, not just average conditions. This includes evaluations of impacts of the dairy on the wetlands, Nene, Koloa duck, shearwaters, monk seals, blind cave spider and arthropod as a result of such seasonal variations.

5. The EIS needs to assess the impact of normal strong trade winds, like 20-30 mph, and sporadic high winds on blowing the airborne liquid fertilizer/manure and smells around Maha'ulepu and toward Koloa/Po'ipu.

6. The EIS needs to address the impact of moving cows and calves, milk, feed and equipment, to and from the dairy to and from other areas on the island, especially impacts on the roads, the traffic, etc. Impacts to the roads and traffic need to be incorporated into county models and repair cycles.

7. The EIS needs to be clear about grass fed vs grain fed criteria in its assessment of environmental and health impacts. If the grass does not grow well enough, will more grain be brought in? And if so, at what point will this no longer be a grass fed dairy, but be grain fed (feedlot). If more grain, less grass, is to be allowed as a contingency, how will this change the EIS evaluations?

8. The EIS needs to be clear as to the maximum number of head of cattle that will be in this and other areas for any given number of milking cows.

9. The EIS needs to address how and when the Maha'ulepu area will be restored when dairy operations cease; and identify bonds to ensure such restoration in case bankruptcy is declared.

10. The EIS needs to assess impacts on cultural and archeological sites, including petroglyphs and burials. This includes impacts on taro loi and other potential agricultural crops.

11. The EIS needs to identify other locations that would be better suited to this sort of dairy, especially locations away from resident populations and visitor destinations. And it needs to identify alternatives uses for this land.

12. The EIS needs to show a comprehensive risk management plan with contingency planning for the various herd sizes possible.

13. The EIS needs to show the maximum density of cattle per acre at various times in the day and through the year.

14. The EIS needs to identify quantities of artificial fertilizers that might be used to help the grass grow and evaluate their impacts especially on water purity levels for drinking water.

15. The EIS needs to identify types and quantities of pesticides and herbicides that might be used, as well as hormones and antibiotics, that might be used. And then the EIS needs to evaluate their impacts, especially on water purity levels for drinking water.

16. The EIS needs to assess the impact of additional pests, like the flies that cattle attract, to the environment and to residents and visitors to Maha'ulepu and the south shore communities.

17. The EIS needs to identify what bonds would be posted to ensure environmental impacts can be remediated, especially in case bankruptcy is declared.

I am attaching a copy of these comments in the attached.

Mahalo for addressing these concerns.

Mary Neudorffer
1870 Ho'one Rd #821
Koloa, HI, 96756
emeleanae@gmail.com

State of Hawaii, Department of Health February 23, 2015

Environmental Planning Office.

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Mahalo for addressing these concerns.

Mary Neudorffer
1870 Ho'one Rd #821
Koloa, HI, 96756
emeleanae@gmail.com

GROUP 70 INTERNATIONAL

May 26, 2016

Mary Neudorffer
1870 Ho'one Rd #821
Koloa, HI, 96756
emeleanae@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 Mary Neudorffer:

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 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.

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.

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 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.

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.

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,

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Subject: Comments to be addressed 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:

The following is my response and comments after reviewing the Hawaii Dairy Farms EISPN, posted on January 23rd, 2015. I am requesting that each of my requests below are included and fully addressed by the Hawaii Dairy Farm EIS.

Section 3.2 Air Quality
Request: All areas of the EIS should evaluate the environmental impact with respect to 699 & 2,000 cows.

The EISPN mentions that the State of Hawaii DOH monitors ambient air at various locations for gaseous and particulate air pollutants. They also mention that air quality standards have been established for the following:

- Carbon Monoxide
- Nitrogen Dioxide
- Sulfur Dioxide
- Lead
- Ozone
- Particulate matter
- Hydrogen Sulfide

Comment: **The EISPN does not include Ammonia or Nitrous Oxide in its scope**, nor does the EISPN discuss monitoring stations and equipment used to monitor and understand the actual dispersal and effect of these gases and odors.

Request: All of these gases, particulate matter, and hazardous material must be addressed. This includes Carbon Monoxide, Nitrogen Dioxide, Sulfur Dioxide, Lead, Ozone, Particulate Matter (and identification of the expected composition of the particulate matter), Hydrogen Sulfide, Ammonia, and Nitrous Oxide.

Request: Each source of gas emissions should be analyzed to include pasture surfaces, effluent ponds, milking barns, etc.

Request: The EIS should include number, locations, and types of monitoring stations required to mitigate these risks.

Comments
These pollutants and compounds have a number of environmental & human health effects.

Ammonia is a Respiratory irritant that is rapidly absorbed by the upper airways in the body. Ammonia exposure can cause chemical burns to the respiratory tract, skin, and eyes. Longer term exposure can cause a severe cough, chronic lung disease and scarring of the airways.

Ammonia also has a direct toxic effect on vegetation. It can disrupt ecosystems, causing algae blooms in water bodies and acidification of soils.

The primary cause of ammonia emission is through land application when the manure is applied to land. This can occur immediately following land application and later over a much longer period when the substances in the soil break down. Nitrous oxide is also discharged in a similar manner.

Hydrogen Sulfide can cause inflammation of the moist membranes of the eye and respiratory tract and can lead to olfactory neuron loss.

Depending on the composition, Particulate Matter can cause Chronic Bronchitis and Chronic Respiratory Symptoms.

Koloa neighborhoods & Poipu neighborhoods are within 2.5 miles of the dairy.

Koloa Elementary School is located about 2.75 miles from the dairy site. Children breathe 20% to 50% more air than adults, making them more susceptible to lung disease and health effects. Moreover, a study in North Carolina found that the closer children lived near a CAFO, the greater the risk of asthma symptoms.

Request: The short and long term effects of all of these gases and particulate matter on the general population need to be included in the EIS. This includes effects on the elderly, people with allergies and/or asthma, etc.

Request: The short and long term effects of all of these gases and particulate matter and their effects on children should be included in the EIS.

Request: The EIS should identify the estimate used for their analysis to cover Ammonia & Hydrogen Sulfide discharges from the application of manure, pond storage, and milking parlor waste.

Request: The EIS should address the direction of the tradewinds and what areas the Ammonia, Hydrogen Sulfide will disperse to.

Request: The EIS should address any impacts based on air quality, to local wildlife and/or endangered species, based on air quality.

Air Quality & Odor

Comment: There is substantial evidence that large dairy farms affect the ambient air quality of local communities. Odor is not caused by a single substance, but as a result of a large number of contributing compounds. The odors emitted from dairy farms are a mixture of ammonia, hydrogen sulfide and other organic compounds. Odors occur when manure is stored in pits or lagoons for long periods of time. Moreover, depending on the method of dispersal when liquefied manure is spread on the land, these odors can be amplified during dispersal and then emanate again after rainfall on the dry land.

Depending on weather conditions and dispersal techniques, these odors can be detected from up to 5 or 6 miles away.

According to wind speed and direction data from weather station data in the Lihue area, the tradewinds blow from a NE & ENE direction at 10 to 14 knots, over 60% of the time. 90% of the time in summer months.

Request: The EISPN should address odor dispersal and air quality in the surrounding communities with the tradewinds blowing in excess of 20 to 25 knots for long periods of time.

Request: The EISPN should address the impact of odor and air quality when little or no tradewinds are blowing which may concentrate odors locally. Wind direction should be analyzed at several locations on the proposed site.

Request: The EIS should address how they will monitor, control and mitigate odor dispersal from the dairy. A graphical analysis showing the overall effect and measurable distance of expected odor dispersal should be analyzed with respect to the numbers of cows in the herd, the amount of manure & urine generated, the methods used to contain and disperse the manure/urine and wind speed and direction. (i.e Odor footprint assessment & setback curves in all directions around the odor sources.)

Request: The EIS should also discuss methods to reduce the effective area of odor dispersal and methods used to continually monitor the situation and establish criteria for how often effluent can be dispersed on the land, and under what weather conditions must be in place for land application. Will wind conditions be taken into effect prior to land dispersal? What method of land dispersal will be used? How long does it take for liquefied manure to be neutralized (stop stinking).

Greenhouse Gases

Dairy farms also contribute to greenhouse gases and can combine with other atmospheric elements to produce haze during periods when the tradewinds are not blowing. Methane and nitrous oxide are 23 and 300 times more potent as greenhouse gases as carbon dioxide. In past studies, the EPA has attributed manure management as the fourth leading source of nitrous oxide and the fifth leading source of methane emissions.

Request: The EIS should assess the amount of greenhouse gases that will be produced by the planned dairy during full scale operations and what effect these gases might have locally as they contribute to haze and/or combine with VOG during periods of southerly Kona winds.

Section 2.4 Alternative Location

Section 2.4 reads: The grass-fed dairy operation requires 500 to 600 acres of usable, gently-sloped land on agricultural zoned lands available for long-term lease.

Comment; Smaller herd sizes would need significantly less acreage. Several alternative locations should be considered with respect to smaller herd sizes.

Request: The EIS should evaluate several other locations for a sustainable "zero discharge" grass- fed dairy. What other locations on island can support the following dairy sizes?

a) 300 cow maximum.
b) 699 cow maximum.
c) 2,000 cow maximum.

Section 2.3 Proposed Action

Comment: "The pasture-based rotational grazing method focuses on growing grass as a local food source appropriate for cow health and quality milk production. The method developed by dairy experts is designed to be zero-point source discharge, meaning 100 percent of the cows' manure will remain on the farm as fertilizer for the pasture grass".

Comment: The zero-discharge dairy is dependent on grass fed cows and initially growing high quality Kikuyu & Kikuyu-Guinea grass.

Request: The EIS should address the environmental impact due to the use of commercial fertilizers used in order to grow this grass prior to the arrival of cows. The EIS should also address the overall effect on endangered species, and the Waiopili stream.

General Topic

This dairy will use significant amounts of water.

Request: The EIS should identify how much water will be needed based on 699 to 2,000 cows and how this amount of water usage will affect the amount of water available to south Kauai – especially during drought years.

May 26, 2016

No Name on letter_envelope

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

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.

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

From: Rita Norman
To: epo@doh.hawaii.gov; HDF
Subject: Hawaii Dairy Farm EIS Notice
Date: Monday, February 23, 2015 4:05:35 PM

To whom it may concern -

I am writing as a concerned citizen of Koloa Town. It is questionable as to whether or not our potential new neighbors have been as forthcoming and neighborly as they ought to have been regarding the Mahaulepu Dairy Farm. Why had an EIS not been undertaken from the outset?

First - they advise that the cows will be fewer in number than originally anticipated. Based upon diagrams that I have seen, it will not take long for even a small number of cows to overtake the parcel. The original number is 699, if I am not correct. Will there be husbandry of any sort, if so, what can we anticipate in the total head count for the future? The EIS should be based upon forecasted growth, not preliminary numbers. When building a new community, a traffic study is based upon intended growth... as should this study.

Second - what can I anticipate in the way of impact on our community, namely excrement. Where will it go? My house (behind koloa town) is on bedrock; is there bedrock on the other side as well? If so, will become of their waste? Do they honestly antipate keeping up with the pace of waste production? What happes is stores are overcome by productions of waste? Will excess/run off go into the ocean? My family swims,surfs and snorkels below the designated dairy location. Can we anticipate pollution of the environment, bacteria infested waters?

Third -what of the odor? What can I expect should we have off shore winds? And will it bring poo flies in my direction?

Fourth - Due diligence. That means that they should have conducted all of the research as it pertains to the comunity from the get go, and they did not. The only inforrmation provided was that with a favorable prespective on their new endeavor. This already leaves a bad impression in my mind for the entire operation.

Finally - most of the people in this community depend on tourism as a primary source of income. What if there are reports of a smelly community and polluted waters? How long will it take TripAdvisor and the many other social networking sites to completely destroy our Poipu's reputation as destination of choice for an authentic Hawaii vacation experience.

Communityleaders - please be sure that all steps are take to assure that these people are acting responsibly, and truly in good faith. This is a trusting community, please do not let them take advantage of us.

May 26, 2016

Rita Norman
rita.a.norman@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 Rita Norman:

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.

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: Tim O'Connor Organization: Olana Farm LLC

Preferred contact Method

Email: grow.kauai@gmail.com Postal Address: PO B 1019 Kilauea 96754

Phone: (Optional)

Comments: Please — request to be a consulted party — notify me of EIS progress & opportunity for comment.

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

Tim O'Connor
P.O. Box 1019
Kilauea, HI 96754
grow.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 Tim O'Connor:

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.

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

Polli C. Oliver
5174 Hoona Road
Koloa, HI 96756

February 19, 2015

Group 70 International
Atten: Jeff Overton, HDF Project
925 Bethel Street, 5th Floor
Honolulu, HI 96813

RE: EIS for the Hawaii Dairy Farm- Kauai - Concerns that need to be addressed

Aloha Mr. Overton:

My name is Polli Oliver. I have lived in Koloa, Kauai for 40 years. My four children were born and reared here in this community. I am writing regarding my concerns about the proposed dairy located in Mahaulepu Valley.

I have several concerns. First is my concern that the massive amounts of manure and urine created by the dairy will detrimentally affect the water quality in the ocean. The waters around Mahaulepu are already extremely polluted as was reported in an article in the local newspaper, The Garden Island, on Feburary 5, 2015:

"In 2014, five locations- **Waiopili Stream in Mahaulepu** , Waikomo Stream at Koloa Landing, Niumalu County Beach Park near Pi'ali Stream, Hanamaulu Stream and Pakalas surfbreak- **were polluted 100 percent of the time time.**

Waiopili Stream had the highest geometric average at 9,100.7 bacteria per 100 ml---**260 time the allowable limit----"**

Again, an article in The Garden Island dated October 21, 2014 reported the following:

In a single 100 ml sample, **there should be less than 104** counted Enterococcus — bacteria which indicates contamination from feces of warm-blooded animals, including humans. If the count exceeds 104, the water is considered polluted. The geometric average of five collected samples should not exceed more than 35 bacteria per 100 ml.

Waiopili's geomean of 14 samples taken since April is 8,806 bacteria — **250 times the state standard** — according to Berg. **One sample, taken July 20, tallied 24,000 bacteria, the highest reading possible with the technology used, he said.**

With an already documented water pollution problem, it seems beyond understanding that a dairy with the type of waste that will be produced, would be allowed. Besides the ocean water

pollution, I am deeply concerned about the drinking water for the Koloa, Poipu area. The wells that supply drinking water for this area are in very close proximity to the proposed dairy. I am concerned that the waste from manure and urine will be above the water table where it will infiltrate other bodies of water, primarily the wells for this area.

In addition to the detrimental effects to water, I am concerned that the flies that will be produced as a result of the number of cows and their waste, will curtail the range of beneficial uses of the environment. I cannot imagine going to Mahaulepu Beach and dealing with the fly problem that I feel sure will be created. Mahaulepu Beach has been a favorite picnic and beach spot for me and my family for 40 years. I can't imagine what it will be like to be at the beach and deal with swarms of flies from the nearby dairy.

I appreciate your sincere and careful investigation into these areas of concern. I have grave concerns about the wisdom of putting a dairy of this size in a place so near the beach and nearby resort locations.

Thank you for your attention in this matter. I look forward to hearing your report and findings.

Mahalo nui loa,

Polli C. Oliver

Polli C. Oliver

cc; Hawaii Dairy Farms, LLC
State of Hawaii, DOH - Environmental Planning Office

GROUP 70 INTERNATIONAL

May 26, 2016

Polli C. Oliver
5174 Hoona 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 Polli C. Oliver:

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.

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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.

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.

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: Michele Olry
To: HDF
Subject: More Comments why HDF project is not acceptable
Date: Monday, February 23, 2015 5:19:40 PM
Attachments: Letter to HDF and DOH.doc

Another comment that I would like to make that seems to be overlooked by most people in the public, is that so many people don't know how milk is made!!!

Cows must be pregnant and calve to produce milk. That means the popluation of HDF's cows will always be growing. A typical dairy cow must "go dry" for 2 months/year to recover and calve once again to produce milk. HDF, like most dairies will most likely use artificial insemination to impregnate their cows. That said, HDF has stated at public meetings that the excess calves, that will not be raised to add to the dairy herd or as replacement cows, will be sold to beef ranchers on Kauai.

What is not discussed, is the fact that dairy cows, particularly the New Zealand Dairy cows they have selected, make inferior beef producing cows. An excellent dairy cow, is an inferior beef cow, because the breed has been developed and selected to put metabolic energy into producing maximum amounts of milk, not muscle for meat production! Even if the dairy cows were a dual purpose breed, or cross bred with beef breeds like Herefords or Angus, the calves would not be worth much to the beef ranchers over time, and the production of calves from HDF each year would flood the beef cow/calf operators on Kauai with less than optimum meat quality cattle.

I do not believe this has been thoroughly understood, discussed or resolved. What would be done then, once there was no place for sale of calves to Kauai beef ranchers? Does HDF propose to start Veal production??? or just euthanize the calves, or ship them for pet food (that certainly would not be economical or ethically acceptable)?

I find so many insufficiently answered or unanswered questions, and it seems HDF continues to keep from dealing with the truth. I certainly hope that the EIS will stand for revealing the truth of HDF's project and the consequences of its practices....most certainly an unbiased dairy scientist must be enlisted to reveal what is to happen for the EIS to be accurate and of any worth.

aloha, Michele Olry

From: m_olry@hotmail.com
To: hdf@group70int.com
Subject: Additional Comments why HDF project is not acceptable
Date: Mon, 23 Feb 2015 16:13:26 -1000

3954 Kiani Street
Koloa, HI 96756
February 23, 2015

To whom it may concern,

I am writing regarding why the selection of the location of Maha'ulepu by HDF and Grove Farms to put an industrial size dairy is unacceptable. I question seriously the facts being used to make the decision of the suitability of the proposal to put even just the initial herd of 600 dairy cows, let alone the soon to be 1,000 plus as planned.

I have lived on Kauai for over 40 years and have a background in animal science and veterinary medicine. We have raised horses, cattle, goats and various livestock at several locations around the south of Kauai. The soils are notorious for producing poor quality grasses, and that compact and erode easily due to the clay composition. Caring capacity for livestock is at best 1-2 animals per acre, rotating constantly to keep pastures in good shape, reduce parasite and manure loads. During heavy rains, typical in the wet season, animals quickly tear up the soil and grasses with their hooves and must be removed for the grasses and soil to recover, and to prevent hoof rot. These facts are being grossly overlooked and inadequately addressed in the HDF plans.

The Maha'ulepu location proposed for HDF's huge dairy herds also has the same problem. In the last 10 years I have worked to assist with the care of marine species, primarily endangered Hawaiian monk seals and sea turtles. On many occasions these endangered species have pupped and nested on the Maha'ulepu coast from near the Gillin house (in 2004) and east to Kamala point. On several years I had experienced rainstorms that lasted several days, causing flooding of Maha'ulepu valley. During those storm events, Grove Farm locked their gates due to the danger of flooding and the high level of water making it dangerous for the public to drive on the roads.

When this has occurred (I remember most recently March 7, 2012), the floodwaters collected in such torrents, that the roads became like rivers to the ocean. It was necessary to use the DLNR DOCARE vehicle, a huge truck with high suspension to get to the beach to collect a dead seal that day. These rain events have happened at least 3 times that I can recall in the last 10 years only, and have caused the removal of dirt to the roads that Grove Farm has sometimes graded, leaving for the last 3 years sharp rocks along most of the south portions of the road. I say this to point out that HDF
and Grove Farms has somehow overlooked these weather events and consequences in their future plans for the industrial size dairy and do NOT address this sufficiently in their plans, due to lack of facts. These rains will occur and the flooding that ensues will cause the water/sewage run off to course down the roads, downhill to the ocean, thereby polluting pristine, critical habitat for endangered species, the marine reef environment and for humans as well.

With any rain event, the runoff comes down the stream, turning it brown with sediment, and forms a discharge out into the ocean and the reef, It most often smells foul, unlike most streams on Kauai, with flooding and sediment plumes out into the ocean. The currents carry the runoff to pollute the shore break where people surf, and often carries it to the west. Adding to this already polluted stream the runoff of manure and cow urine is unthinkable!

I have lived and worked in locations near dairies, in central California (Tulare) and parts of Washington (Vancouver) and these large dairies produce so much effluent of liquid manure and associated gasses, that it is almost intolerable to be within a couple of miles of them due to the stench (this even in progressive dairies that use the methane to produce energy on the farms). I cannot imagine a more destructive type of agricultural practice to locate in the scenic, pristine, culturally and environmental sensitive location of Maha'ulepu valley.

I support agriculture and I find it increasingly sad to see such poor choices for land use of Kauai (this over the years means over development for tourism). I cannot highlight enough the lack of awareness, planning and concern to the impact of water and air quality if HDF is allowed to put an industrial dairy in Maha'ulepu. Several years ago, Grove Farms had proposed small farms to produce local vegetables and fruits, something that is sustainable and good for Kauai's environment and its' inhabitants (human and wildlife). What happened to that plan? The milk plan is fraught with all sorts of unmentioned problems from bacterial and medical contamination to pollution and parasites to water, land and air.

A small dairy may be permissible, but not the industrial sized dairy that HDF and supporters have as their goal. I cannot fathom in this day and age, with the scientific knowledge and optimum land use practices that we have, why we on Kauai would allow such an unacceptable use of Kauai's unique and valuable places like Maha'ulepu? I hope and believe that the EIS will reveal this, as well as the investigations of the Department of Water and Health.

As a side, or solution, why not consider coconut milk??? It is economically, and environmentally more acceptable, as well as it is more healthy for humans (certainly sells for more per pint) and would not require the destruction of Maha'ulepu or Kaua'i as a whole.

Sincerely,

Michele Olry

3954 Kiani Street
Koloa, HI 96756
February 23, 2015

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Sincerely,

Michele Olry

May 26, 2016

Michele Olry
3954 Kiani Street
Koloa, HI 96756
m_olry@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 Michele Olry:

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.

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.

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

Dick & Maria Olson
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1901 Poipu Rd - Kahala 222 Poipu Beach Koloa, Kauai, Hawaii

RECEIVED
FEB 27 2015
GROUP 70 INTL

February 22, 2015

Group 70 International, Inc.
Attn: Jeff Overton
925 Bethel Street, 5th Floor
Honolulu, HI 96813

Dear Mr. Overton;

We have been homeowners on Kauai, in Kahala at Poipu Kai since 1996. The life on Kauai is second to none, except now there is the issue with the proposed dairy farm in our back yard.

Our home away from Kauai is Wisconsin and we have plenty of cows. The issues pertaining to dairy herds has been an issue in our home state for many years. The dairy industry in Wisconsin and in other parts of the United States has been changing, and the environmental concerns those changes pose.

With this increased concentration of milking cows comes a corresponding concentration of manure production. And what happens to this manure is at the heart of the pollution issues surrounding the dairy industry.

In Wisconsin, several dairy operations are now facing opposition to plans to expand their herds. Porous karst soils in the parts of Wisconsin where a significant portion of dairy expansion is occurring present some unique environmental issues. Run-off from dairy farms and other agricultural activities has seeped into aquifers and elevated levels of nitrogen, in some instances to unsafe concentrations; in one recent case, the Wisconsin Department of Justice levied a $65,000 fine against a dairy operation for contaminating groundwater.

Similar issues will face the Poipu area should this dairy farm be permitted. The economic effect on ours and neighbors investments will be in jeopardy. Not to mention the many local merchants that have expanded their businesses to the Poipu area.

We strongly request that the dairy farm proposal be denied. Our request needs to be addressed and answered by the EIS..

Aloha...

Dick & Maria Olson
Dick: 414-559-5323 (DickOlson@earthlink.net)
Maria: 414-975-7577 (MariaEOlson@earthlink.net)

GROUP 70 INTERNATIONAL

May 26, 2016

Dick and Maria Olson
6955 S. Riverwood Blvd., #304
Franklin, WI 53132

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 Dick and Maria Olson:

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.

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.

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 by US mail and by email: epo@doh.hawaii.gov and HDF@Group70int.com

To: Laura McIntyre

State of Hawaii, Department of Health
Environmental Planning Office
1250 Punchbowl Street

Honolulu, HI 96813

and

To: Jeff Overton

Group 70 International, Inc.
925 Bethel St., 5th Floor
Honolulu, HI 96813

and

To: Hawai'i Dairy Farms, LLC.

P.O. Box 1690

Kōloa, HI 96756-1690

From: Lorraine Osterer, 1640 Makanui Road Unit 2, Koloa, Hawaii, 96756

Because the EA was skipped, and because many Kauai residents have been misled to believe the Proposed Dairy is "a done deal", I suggest that further efforts should be taken to inform all Kauai residents of the EIS process with correct facts and figures, some of which are in contrast with previous reports, public meetings and advertisements by Hawaii Dairy Farms, LLC (HDF). I suggest the comment period be continued.

I represent my 93-year-old Mom and myself as permanent residents of Koloa, and would like you to consider the retired, less mobile seniors of this community, whose health and security would be impacted by a nearby Dairy. I am invested in seeking the truth, to protect my lifelong dreams, health and equity, after 40 years of sacrifice to afford to live here. I would like to participate in the entire EIS process and related evaluation, expecting we deserve protection by our public processes.

Impartial Studies are needed: One of my first concerns is for a non-partial independent research firm to conduct the EIS. Group 70 International is an architectural design company with vested interest to design the buildings of the project. Since there is a current conflict of interest, I ask for a determination whether this company should conduct the EIS, and suggest that their former investment would not insure an unbiased report. Alternatively, the research and reporting consultants should be selected by agreement with other interested parties, including Department of Health (DOH) and Friends of Mahaulepu.

Site Location: The Mahaluepu location does not seem to meet the needs for soil absorption or water supply, as referenced in section 3.1.3 of the EISPN. NRCS soil studies show it is mostly clay. The water supply is questionable and needs legal review, since the 1957 Huleia diversion seems to be in violation of state public trust doctrine and Hawaii State Constitution, and that water flow was agreed to be returned to its former natural state. An acceptable alternate location should be found for evaluation in the draft EIS. Since the same owner has evidently purchased the only other Hawaiian Dairy, the EIS should evaluate why he cannot simply expand the herd at that site or others on the Big Island.

Public Health Regulation: Referring the EIS Preparation Notice, concerning DOH regulatory reviews at the bottom of p. 2-2 in section 2.3, the 699 cows are all pregnant, producing milk, so how long before the first calf is born and the herd exceeds the existing permits? HDF's July 2014 plan refers to a 2000 cowherd. A Waste Management plan for a large CAFO should be required for DOH review in the draft EIS.

Public Health Issues and Water Quality: The bottom of page 3-3 states there are no existing hazardous elements, however the current measured Waiopili stream pollution levels are hazardous. These independent TestAmerica results are available to the public at the friendsofmahaulepu.org website and Surfrider organization. Enterococcus bacteria for the summer sampling is 514/100 ml for Gillin's beach and 8880/100 ml for Waiopili Stream, dangerously above State standards (35). The yearly average from 19 samples of the Waiopili Stream is 9,100, a constant source of pollution into the ocean. Since this significant data was omitted, can we count on complete accuracy of an EIS report by the same methods of the same company? How can the nearby wells be protected? Groundwater studies indicate the wells will become polluted. The risk to the entire Koloa fresh water supply is extremely high with the plan to pump thousands of pounds of manure sludge from the collection pond down slope to Block H, nearest the wells. Nitrate toxicity will also result from storm runoff. Additional diseases can result from transmission by wind, insects, and runoff. The EIS must thoroughly evaluate risks to air, ground water, drinking water, and ocean pollution, with preventative actions, corrective actions, and bonds to ensure public protection.

Degradation of Enveironmental Quality: The proposed Dairy site can be seen from my house, which is about 2 miles downwind. We are already affected by winds carrying the GMO chemicals from the same area. Will the EIS evaluate the chemical affects of nearby GMO crops on the Dairy and milk produced? The smell of cow manure and flies would also be carried by the strong winds so common to this area. Unlike the Moloaa dairy in summer, where one could drive by and hold your nose temporarily, we will not be able to escape the smell from a Mahaluepu dairy operating 24-7 all year

Substantially affects a rare, threatened of endangered species or its habitat: Pristine shoreline, monk seals, and other endangered species would be affected. The EIS must consider the endangered species and in particular, the designated ecologically sensitive marine shoreline.

Environmental and Economic Welfare, Cumulative Effect would be Irreparable Damage: Major properties, such as the Hyatt resort, are already planning to sell if the Dairy comes in, which would start the de-escalation of property values, that have not yet recovered from the previous economic crisis. Based on the information presented in the HDF plan, and documented New Zealand studies, where the climate is more temperate, major pollution is predictable. Our warmer climate, clay soil and slopes will accelerate the process of manure, nitrates and phosphates into the ocean. The NRCS Custom Soil Resource Report Review indicates that the amount of waste cannot be absorbed by these soils. The polluted ocean, flies and odor would keep everyone from enjoying any outdoor activities at the beaches, shoreline, and our own yards.

And Involves Substantial Secondary Impacts: The Dairy effect on jobs and tax revenue will never compensate for the job loss at resorts, and the loss of tourism dollars. A major resort reports cancellations already due to news of the future Dairy. All of us depend on tourism, one way or another.

I believe that shoreline conservation is something we have a right to protect for all and for the future of Kauai. In particular, a Dairy at this location, only 1 mile upstream, causing waste to flow into the westerly current just east of our most popular major beach resorts, would negatively impact the entire Kauai economy.

This project has been advertized as a sustainable project. It is not. The milk will not be processed and stay here on Kauai. Livestock is the most inefficient use of agricultural land for food production. The methane produced by cows far outweighs all other energy conservation methods for Kauai. The methane destruction of the ozone layer, reported as significant over New Zealand, will mean a hotter, dryer climate for Kauai with future draught conditions. Recovery of the climate and the economy would be impossible. The Cumulative effect would be considerable deterioration of the environment and conflict with Kauai's long term environmental guidelines in HRS 344., etc. No plan for remediation of pollution has been included, and must also be evaluated in the EIS.

Thank you for your consideration,

Lorraine Osterer Lorraine Osterer

Email: losterer@hotmail.com

GROUP 70 INTERNATIONAL

May 26, 2016

Lorraine Osterer
1640 Makanui Road, Unit 2
Koloa, HI 96756
losterer@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 Lorraine Osterer:

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.

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 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-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 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, 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, 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 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 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

Dear Jeff,

I am writing to express my deep concerns about the Mahala'pu Dairy HDF proposed dairy on the south shore of Kauai.

It is just the wrong location for such an operation. The site makes no sense. So close to a world-renowned beach resort area and in such a special valley with sacred historic significance . . . air stench, land degradation, water pollution, biting flies . . . is this just a strategy for the owner to reduce property tax?

Air, land, and water quality will be irrevocably degraded. Water quality in the streams is already a concern so the dairy will undoubtedly pollute the stream beyond what any of us can ever imagine. It defies logic. We understand the State wishes to be more self-sufficient with local agriculture production but the costs outweigh the benefits.

Please do what you can to stop this dairy before it is too late.

Sincerely, Patty Oxford

Patty Oxford 2229 Iukika Place Koloa HI pattygogirl@gmail.com

2-20-15

GROUP 70 INTERNATIONAL

May 26, 2016

Patty Oxford
2229 Iukika 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 Patty Oxford:

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.

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 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 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.

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

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: John Petterson Organization: ✓

Preferred contact Method

Email: bathyslab@gmail.com Postal Address:

Phone: (Optional)

Comments: Is there a no-action option that will be followed if the EIS determines harm? Or potential harm?

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

From:	John Patterson
To:	epo@doh.hawaii.gov; HDF
Cc:	John Patterson
Subject:	Comment for HDF DEIS
Date:	Sunday, February 22, 2015 4:36:20 PM
Attachments:	HDF EISN Comments.pdf

Aloha please find my comments attached as a PDF file

Mahalo.

John Patterson

Comments and Questions for the Hawaii Dairy Farms Draft EIS

Feb 22, 2015

Aloha,

My comments and questions will be direct and to-the-point.
The questions that require an answer are clearly shown by ***bold italics.***

This project proposed by Hawaii Dairy Farms (HDF) is likely to have impacts for at least four of the criteria listed of the thirteen categories of Significance Criteria identified in HAR Chapter 200.

Specifically they are :

7. Involves a substantial degradation of environmental quality;

Dairy farming has been shown in many instances to cause significant environmental impact. These impacts are well-known and well-documented. Dairy farms located in coastal marine areas are especially prone to cause environmental harm. A good example of this was a study published in Scotland in 2008 showing the direct effect a dairy had on causing fecal coliform counts to close nearby bathing beaches (Ref 1) . There are numerous popular beaches within 750 meters of the HDF site. Furthermore, dairies have been shown to cause harm to local water supplies. Recent examples of dairies degrading the groundwater and nearby environment are common: in Oregon, Wisconsin and California have all had recent examples where dairies were cited and fined for damages caused to water resources.

The EIS for HDF will need to show how the plans proposed here are substantively different than those shown to fail in other dairies such as in New Zealand or the US Mainland where environmental harm has already been established. Indeed, HDF has hired a person from New Zealand to manage the dairy and to implement “New Zealand Dairy Practices”. Thus looking carefully at the results of these practices is warranted here before HDF begins operations.

Dairy farms in NZ have decimated several river systems throughout the country such as the Waikato River. In fact the practices earned a name and a special Wikipedia entry under “Dirty Dairying” (Ref 2). The magnitude and significance of these impacts can be seen through the legislative actions taken by the NZ government. There, dairy farming practices had such detrimental impacts on the environment that the Government passed the “Dairying and Clean Streams Accord”. Despite these measures, there are still many signs that diary farming is causing ecological harm in NZ.

New Zealand - just like Kauai - has a "pristine environment" brand to maintain to continue receiving it's main form of income - tourism. Any degradation of that image can cause significant economic hardships.

I used the guidelines from NZ's one dairy industry to see where they would locate a dairy. Looking at page 19 from DairyNZ "FDE Farms Guid to Pond Design" we see **the number one consideration** when locating an effluent pond is "proximity to coastal marine areas".

If this is the number one consideration, then why is HDF being allowed to build their effluent ponds less than 1.5 miles from a pristine undeveloped coastal area?

What is the total 24-hour rainfall amount that they use as a number to calculate effluent pond size?

The effluent ponds shown here are for the 699 cow operation - would another EIS be required to add an additional 1301 cows as proposed for the future? When will HDF decide to add more animals?

How does the regulation change when the 700th cow is born into the herd?

What happens to the calfs that are born on HDF?

8. Is individually limited but cumulatively has a considerable effect upon the environment or involves a commitment for large actions

In fact, the actions of HDF will impact the environment *primarily* in this way: no one day of manure spraying will ruin water quality, nor kill endangered spiders, nor ruin the nearby reefs - *it is the repeated small impact of these actions that will result cause potential irreparable harm*. This harm will take the form of increased nitrogen and phosphate levels in nearby waterways, increased levels of pathogens in nearby streams, and this raises the possibility of these pathogens getting into the public water supply located less than 1/2 mile away. Any reputable environmental impact statement must clearly address this issue. High levels of N and P are something even grade-schoolers learn about as a result of this type of operation. These lead to algal blooms, lowered oxygen levels in the waterways, and other well-documented effects.

At present what plan does HDF have to prevent sprayed effluent from the southern boundary of the property from running into the stream that drains this entire pasture?

HDF told me that they would not spray "if rain was predicted within the following 2 days" - this implies to me that they realize that run-off from their spraying could cause harm to the nearby streams.

However on Kauai, rainfall cannot be predicted with any type of long range precision - what expertise do HDF personnel have forecasting rain in this area? It is common to have short heavy downbursts that will cause any recently-sprayed manure to immediately run into the drainage streams**.** These lead directly to the ocean near Gillian's Beach.

How will HDF monitor and mitigate the effects of their run-off in this type of scenario?

If they install water quality monitoring wells as mentioned, what thresholds will be used to determine the need to cease or alter operations at HDF?

With the likelihood of unexpected heavy rainfall events leading to run-off from the pens to flow into the nearby streams and then directly into the ocean less than 900 meters downstream, the EIS should propose the alternative location or the no-action proposal.

With the possibility of unexpected heavy rainfall events leading to an overflow of the effluent pond into the nearby streams and then directly into the ocean, the EIS should propose the alternative location or the no-action proposal.

9. Substantially affects a rare, threatened, or endangered species, or its habitat

At least one highly endangered species lives approximately 500 meters from HDF property line and adjacent to the stream that carries the the effluent into the ocean. That species is *Adelocosa anops* The Kauai Cave Wolf Spider. I note that no mention of this is made in Section 3-2 of HDF EISN, though this endangered spider is well-known.

How can HDF explain/justify that their frequent spraying of manure and effluent in the adjacent plots will not lead to further threat to the habitat of this spider?

With the proximity to both the sinkhole with its rare arthropods and potential cultural artifact site, why would you not accept the alternate site proposal?

What has USFW said regarding this endangered species and the dairy's location?

Use of parasitic wasps to control fly populations on HDF:

No mention of this is made whatsoever in the HDF EISN, however several times they have mentioned to the public the planned use of parasitic wasps to control fly populations.

Is HDF still planning to use parasitic wasps to control flies?

If not, how will they control flies?

If they use parasitic wasps or other biological control vectors - will these be native species? Or non-native species with the potential to interact in unknown ways with the fauna found on Kauai? Are the EIS authors aware of a SCIENCE paper from 2001 that showed the invasive spread of parasitic wasps into Kokee and the Alakai Swamp region and that the majority were seen to be introduced species for biological control?

The authors state:

"Although it is impossible to fully understand the dynamics of this system after only 2 years of study, there is little doubt that the community structure has been altered considerably from its original state." (Ref 5)

Any such biological controls must be fully addressed in the draft EIS.

10. Detrimentally affects air or water quality or ambient noise levels

Numerous studies have repeatedly confirmed the presence of pathogenic organisms in cow manure. These organisms may sprayed each time the pivots operate. They include *anthrax, Brucellosis, salmonella,* and *listeria (*ref 4*).* These airborne pathogens can travel hundreds of meters in the wind and land in unknown areas to cause well-documented harm or disease.

How will HDF mitigate the spread of these pathogens into the neighboring populated areas?

With the main drinking water well for the area located only 1/2 miles from the HDF boundary, and thousands of people dependent on this water source, why would the EIS not recommend the alternative site option?

Dairy farms use a lot of fresh water in their operation.

What is the forecast amount of water to be used daily by HDF?

What is the source of fresh water to be used by HDF?

Dairies are well-known to smell bad and for this smell to travel for up to several miles downwind. Strong trade winds (15-25 mph) blow from E to W on the property for many months each year. Flies are also a major problem both for the dairy and the adjoining land owners.

How will HDF control the smell of sprayed manure from drifting west into the prime tourist area on Kauai?

What actions will HDF take if numerous complaints are made to local hotels and restaurant owners if there are flies and or noxious odors?

****

Thus there are many reasons to believe this EIS should lead to a no action or alternative action decision. These include:

- **proximity to a pristine coastal area**
- **potential harm to nearby waterways and drinking water supplies**
- **upwind proximity to a primary economic/tourist area**
- **potential harm to endangered species**
- **small economic benefit to the Kauai community**
- **need to import 30% of the feed from off-island, therefore negating the USDA's criteria for using the marketing term "grass-fed"**

In conclusion, to deny the longterm detrimental effects seen many times before with this type of intensive dairy operation would be environmental blindness. To place such an operation so close to pristine reef and ocean is irresponsible stewardship of the 'aina. It would be disheartening to see good people, many with PhDs in biology and environmental sciences decide to green-light a project like this.

I urge the EIS to elect for either the alternative location or the no-action option.

Sincerely,

John Patterson Ph.D., UT Austin, Department of Zoology

Wailua, Kauai

References:

Ref 1 Faecal indicator pollution from a dairy farm in Ayrshire, Scotland: Source apportionment, risk assessment and potential of mitigation measures A.J.A. Vintena, et al Water Research Vol 42, Issues 4–5, February 2008, Pages 997–1012

Ref 2 http://en.wikipedia.org/wiki/Dirty_dairying

Ref 3 . "Water quality in low-elevation streams and rivers of New Zealand: recent state and trends in contrasting land-cover classes". Larne, Scott T.; et al (2004)New Zealand Journal of Marine and Freshwater Research (National Institute of Water and Atmospheric Research) 38: 347–366.

Ref 4 http://www.epa.gov/agriculture/ag101/impactpathogens.html

Ref 5 Infiltration of a Hawaiian Community by Introduced Biological Control Agents M. L. Henneman and J. Memmott* 7 AUGUST 2001 VOL 293 SCIENCE

GROUP 70 INTERNATIONAL

May 26, 2016

John Patterson

bathyslab@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 John Patterson:

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 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 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 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 22, 2015

Via Certified Mail, Return Receipt Requested (also via e-mail to:HDF@Group70int.com; laura.mcintyre@doh.hawaii.gov):

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

Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, HI 96813
hdf@group70int.com

Hawaii Dairy Farms, LLC
PO Box 1690
Koloa, HI 96756-1690

Re: Concerns that need to be addressed Regarding the Proposed Hawaii Dairy Farm (HDF) in Mahaulepu, Kauai

Aloha Ms. McIntyre:

I am a homeowner and full time resident of Poipu, residing directly next door to the Grand Hyatt Kauai Resort & Spa which is approximately 1.5 miles away downwind from the proposed Dairy Farm location. I work full time in real estate and have lived in my current home for nearly two decades. As a homeowner and Realtor on the South Shore of Kauai I am extremely worried about the proposed Dairy Farm location and have some specific concerns that need to be addressed.

Negative Economic Impact: My biggest concern by far is the negative economic impact the HDF will have on the South Shore of Kauai which in turn will have a huge negative economic impact on the rest of the island. **What will HDF's existence do to our property values and how will it impact the world class visitor destination that exists today on the South Shore?** Poipu is a resort area and the most popular visitor destination on the entire island, not to mention one of the top locations in the entire state. It is home to two of the largest resorts on the island and hundreds and hundreds of vacation condominiums and vacation rental homes which account for the majority of the property tax revenue the County of Kauai receives. As a full time homeowner/resident, I am definitely in the minority as most of the homes and condos in the area are vacation rentals and pay the second highest property tax rate on the island. The Grand Hyatt alone employs nearly 1,000 local residents (many from the same families). The vacation rental condos and homes in the surrounding area employs many locals as well (housekeepers, maintenance workers, landscapers, property managers, etc.). The mere mention of a "Dairy Farm" being constructed in the area has already raised concern by the traveling public – the word is out. If HDF is able to proceed with their plans, the environmental and health and welfare concerns will be realized and the South Shore will no longer be the tourist destination it is today. The news of contaminated ocean/beaches, contaminated potable water, contaminated air resulting in 24 hour horrific smells, flies and insects, etc. will spread like wildfire via social media which will be picked up by national news and spread worldwide within days if not hours. If the visitors aren't coming, local employees will be laid off at the hotels, property management companies, cleaning and maintenance companies, landscape companies, local restaurants, activity companies, rental car companies, golf courses, fitness centers, spas, retail outlets, wedding related businesses, and more. They will lose their health care and many will lose their homes. There will be

a devastating and irreparable impact to not just the South Shore of Kauai, but the entire island via the ripple effect. If local employees in Poipu aren't working, they aren't buying new vehicles at our local car dealerships; they aren't shopping for as many groceries in our local grocery stores, eating out in restaurants, or visiting their local hair salons. They will cancel their memberships to our fitness centers and they won't be taking their family out to the movie theater or to other activity companies, etc. There are many jobs that stand to be lost in Poipu which in turn will result in other job losses island wide from local businesses that are impacted. What kind of impact will the presence of a Dairy Farm have on the South Shore Community Plan which proposes another hotel and hundreds of homes to be built even closer to the proposed Dairy Farm location than the Hyatt now sits? Is the implementation of a Dairy Farm in line with the South Shore Community Plan?

Negative Environmental Impact: I am very concerned about the negative environmental impact the HDF will have on the South Shore. I am concerned that the water in the proposed area is already showing severe contamination which the source is yet to be determined by the State. The Department of Health needs to investigate this and not allow anything further to proceed in this area! The source of the current contamination needs to be studied and once found corrections need to be made. Should HDF be allowed to proceed it is inevitable that there will be contamination to our beaches and ocean water, potable drinking water, horrific 24 hour a day smells from contaminated air, and an influx of flies and other insects such as wasps that will be introduced to try to control the flies. These are just some of the major concerns that need to be studied in depth. The presence of even one of these environmental concerns will have a devastating and irreparable impact to our island.

Summary of Concerns: The environmental and economic impacts need to be thoroughly, fairly, and honestly studied in the EIS. The EIS needs an expert that is an Economist as that is lacking in all of the so-called studies they have done so far. To be clear, I am not opposed to a Dairy Farm operating on Kauai, but I am opposed to the proposed location on the South Shore. Why would the State of Hawaii and County of Kauai allow HDF to construct and operate in a location that poses such a huge significant risk to this culturally and economically sensitive area? Why risk a few thousand jobs when less than two dozen jobs will be created with this new venture? Why risk the amount of revenue the County and State receives from the existing properties, businesses, and individuals in order to allow a new venture that will provide almost no revenue in comparison? It makes no sense for this location. What is the contingency plan? What if HDF is allowed to proceed and operate in the current proposed location and what if some or all of our environmental concerns become reality? What is the contingency plan? Will HDF have to cease operations? To date, I have not read nor heard of any contingency plan. HDF states all of the public's concerns are going to be non-issues…but what if they do become issues? Then what? Do not allow Poipu to be the guinea pig of the island. Put it in an area of the island where the potential environmental and economic impact is minimal first to see how it goes. I see the name is Hawaii Dairy Farm**s**, LLC (Farms is plural) so it is obvious this proposed dairy at Mahaulepu is the first of more to come. Don't let the South Shore of Kauai be the guinea pig!

Mahalo in advance for addressing my concerns.

Kymry A. Perez
1649 Kelaukia Street
Koloa, HI 96756
(808) 635-1490
Kymry@Kymry.com

GROUP 70
INTERNATIONAL

May 26, 2016

Kymry Perez
1649 Kelaukia Street
Koloa, HI 96756
Kymry@Kymry.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 Kymry Perez:

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.

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).

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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

2224 Walelia Place
Koloa, HI 96756
February 20, 2015

Group 70 International, Inc.
925 Bethel Street, 5th Floor
Attn: HDF Project
Honolulu, HI 96813

This letter is in regard to the proposed dairy at Mahaulepu, Kauai. **Let me preface my comments by saying that I am absolutely opposed to ANY development of this pristine area of Kauai.**
There are many reasons for my adamant opposition to commercial development of any kind in this area:

DETRIMENTALLY AFFECT AIR AND WATER QUALITY

- Waste generated by the large number of cows on the allotted acreage will pollute the ground, water and air, regardless of the waste management plan.

INVOLVES SUBSTANTIAL DEGRADATION OF ENVIRONMENTAL QUALITY

- Proposed site is close to the ocean and reef; resulting waste run-off will irrevocably damage the environment.
- Soil is not suitable for absorption of waste.

SUBSTANTIALLY AFFECTS ECONOMIC AND SOCIAL WELFARE OF COMMUNITY

- Waste will create an adverse environment for both residents and tourists i.e.: odor, biting flies, air-borne contaminants, etc. Tourists will go where there are no unpleasant environmental issues; residents will lose value on their home investments and want to leave the affected area. Poipu, as a tourist destination, as well as an ideal place to live, will be ruined.

SUBSTANTIALLY AFFECTS PUBLIC HEALTH

- The amount of manure will generate thousands of biting flies; this will obviously affect public health and will be a detriment to our health and welfare.
- The damage to our water, both ground water and ocean water, is inevitable and irrevocable; nothing could be worth the loss of our clean water.

Kauai residents do not want the dairy at Mahaulepu. Kauai tourists do not want the dairy at Mahaulepu. We all want Mahaulepu to stay just the way it is: beautiful, clean, undeveloped, loved and appreciated by all. It is a natural resource that must remain as it is so we and our future generations can continue to love and cherish our 'aina. It is our kuleana.

In addition, I must add that since HDF has hired Group 70 to do the EIS, and I understand that Group 70 has also done other work for/in support of HDF, I find it hard to believe that there is no conflict of interest. It does not seem to be an impartial group that is doing this EIS; therefore, I'd question the legitimacy of the EIS if it is favorable for proceeding with HDF at Mahaulepu.

Sincerely,

Carol Pescaia

From: carol pescaia <carol.pescaia@hawaiiantel.net>
Sent: Friday, February 20, 2015 4:03 PM
To: HDF
Subject: mahaulepu
Attachments: mahaulepu 2.rtf

2224 Walelia Place
Koloa, HI 96756
February 20, 2015

Group 70 International, Inc.
925 Bethel Street, 5th Floor
Attn: HDF Project
Honolulu, HI 96813

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Sincerely,

Carol Pescaia

Carol Pescaia

May 26, 2016

Carol Pescaia
2224 Walelia Place
Koloa, HI 96756
carol.pescaia@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 Carol Pescaia:

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

February 14, 2015

RECEIVED

FEB 18 2015

GROUP 70 INTL

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

Re: Hawaii Dairy Farms
Island of Kauai, Koloa District
Tax Map Key: (4) 2-9-003:001 (portion) & 006 (portion: (4)2-9-001:001
Applicant: Hawai'I Dairy Farms, LLC

Dear Mr. Overton,

This proposed dairy farm is near a residential, tourist and environmentally sensitive area and should not even be considered for a dairy farm.

I am not a scientist------but the facts and science is very clear that human excrement is less than .75 pounds per day and cow excrement is more than 75 pounds per day. Eighteen hundred cows is the equivalent of 180,000 humans excreting in the open untreated everyday at the proposed site!! I know for another fact-------the state, county and federal governments would never allow a park, hotel, or private property owner to be allowed to leave untreated sewage in any area---let alone an environmentally sensitive area and close to any residential or tourist area.

The proposed dairy farm is not a "Green" environmentally safe development.

If this dairy is allowed and the negative effects of air quality, water quality and loss of property values, I do intend to pursue monetary damage claims through the legal system.

Sincerely

Greg Petersen
1654 Kelaukia Street
Koloa, Hawaii 96756
Email: petersengreg@msn.com

RECEIVED
SAFE DRINKING
WATER BRANCH
DEC 23 2014

Greg Petersen
1654 Kelaukia Street
Koloa, Hawaii 96756

Ms. Joana Seto
Department of Health
Safe Drinking Water Branch
P.O. Box 3378
Honolulu, Hawaii 96801-3378

December 22, 2014

Re: Hawaii Dairy Farm Application at Maha'ulepu, Kauai

Dear Ms. Seto,

I am an owner of a home at 1654 Kelaukia Street, Koloa, Hawaii and a strong property rights advocate. I am also a strong advocate for responsible property development. The proposed dairy farm at Maha'ulepu on the island of Kauai is an extremely poor location for a dairy farm as it will disrupt tourism which will effect employment, depress property prices-----along with the tax base, and cause significant environmental damage to the community, water quality and possible ocean habitat.

It is hard to believe the State of Hawaii and County of Kauai has allowed this to proceed. It has almost no benefit to the county of Kauai and WILL adversely affect the quality of life for everyone on the South Shore of Kauai. The amount of manure generated by these cows would probably be in excess of what 30000-50000 humans excreting daily in the open on that acreage. I'm sure the State and County would not allow that to ever happen!!!

I plan to be a part of any legal action and claim if this permit is allowed, against the State of Hawaii, County of Kauai and the applicant, Hawaii Dairy Farms and to seek damages and compensation for loss of property value along with environmental damages.

Thank you for your time and attention to this very important issue. This does impact a significant amount of people who live and visit the island of Kauai!!

Best regards

Greg Petersen

May 26, 2016

Greg Petersen
1654 Kelaukia Street
Koloa, HI 96756
petersengreg@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 Greg Petersen:

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.

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

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Page 1 of 2

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Saved Chats

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Proposed Hawaii Dairy Farm - Maha'ulepu Valley- Kauai

From: rowlie <rowliep@aol.com>
To: epo <epo@doh.hawaii.gov>
Cc: rowliep <rowliep@aol.com> bridgethammerquist <bridgethammerquist@hawaiiantel.net>
Date: Mon Feb 23, 2015 1:58 pm

The Hawaii Dairy Farm states they will operate a Zero Discharge Grass Fed Dairy in the Maha'ulepu Valley.
Require them to prove " Zero Discharge" of nitrate nitrogen a major contaminant that ammonium nitrogen
converts to.

Their claims make it sound like a cut and dry cycle. Cow eats the grass, cow poop's on grass, grass takes up
manure for grow, cow once again eats the grass, and the cycle continues on. No worries problem free.

This sounds good but it doesn't work this way.

The form of nitrogen in manure is Ammonium. Ammonium contains a positive charge and attaches to clay
clay particles. In two or three days with temperatures fifty degrees or higher the ammonium changes to
Nitrate nitrogen. Nitrate has a negative charge and does not attach to clay or soil particles. It now is in the soil
solution moving readily in water. Although nitrate is the primary source of nitrogen used by the plant it also is the primary source of Nitrate contamination due to it's mobility in water. This is the form that works it's way into drainage ditches, creeks, rivers, and ground water, oceans, water wells.

The application of fertilizer to these proposed small pasture segments is all top dressed. That is they are not worked into the soil by mechanical means. The poop is dropped by the cow on top of the grass and soil, the water diluted manure from the holding ponds is also applied on top through a sprinkler system, And any supplemental commercial fertilizer will also be applied on top. Thus, very vulnerable to run off the surface by
rain fall and the build up of water in the soil solution will cause it to move more rapidly in the form of leaching.
The sprinkler application is also vulnerable to wind drift into undesirable areas that would provide access to the
streams and ocean.

Oder and flies are obvious problem that the public can easily identify. But Nitrate contamination is more subtitle and silent moving slowly. A sleeper. But once it's discovered in water wells as well as it's negative affect on the ocean fauna it's late.

A weed is very much a plant but it is growing in an undesirable place.The proposed Hawaii Dairy Farm is very much a dairy but trying to locate to an area that is down wind and a major tourist area and employer to residence of the island.

The dairy is not compatible agriculture with Koloa and Poipu. There is nothing wrong with the milk we receive on this island from the mainland. It would be more reliable if there was a hurricane on this Island than a ravished contaminated local dairy due to the hurricane. And the swirling winds of the hurricane picking up the water from the holding ponds and depositing it through out the area. Does anyone remember hurricane Iniki?

IN CONCLUSION DEMONSTRATE" ZERO DISCHARGE" OF NITRATE NITROGEN THAT WILL NEVER GET INTO THE GROUND WATER, WATER WELLS, AND THE OCEAN.

REPLACE THE DAIRY IDEA WITH ANOTHER SOLAR PANEL PROJECT LIKE THE ONE JUST COMPLETED BY THE OLD KOLOA MILL. THIS WOULD HELP EVERYONE IN LOWERING ELECTRICAL RATES. THE WEEDS UNDER THE PANELS WOULD BE CONTROLLED BY FLOCK OF SHEEP (GOATS MIGHT JUMP UP ON PANELS). A TRULY COMPATIBLE USEFUL USE OF AGRICULTURE ZONED LAND
UPWIND FROM A MAJOR TOURIST AND RESIDENTIAL AREA THAT IS A MAJOR EMPLOYER.

Rowland Pilaria
P.O. Box 1235
Koloa, Hi 96756

GROUP 70 INTERNATIONAL

May 26, 2016

Rowland Pilaria
P.O. Box 1235
Koloa, Hi 96756
rowliep@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 Rowland Pilaria:

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 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.

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.

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

2/21/15

Group 70 International, Inc
HDF Project
925 Bethel St, 5th Floor
Honolulu, HI 96813

Dear Sirs,

I live in Koloa on Kauai and I am a real estate agent and artist.

I live 3 miles down wind from the proposed dairy you are trying to push through. I have grave concerns for the health of my family, the devaluation of our life investment - our home. I am concerned about the economical impact this will have on all of us who are dependent on the visitor industry when they stop coming and book trips to another island or at least to Kauai's North Shore instead. The South shore supports 30% of the property tax base on Kauai.

I have personally lived near dairies before having grown up in California and the East Coast. I know what it smells like to be close to even a small 50 herd dairy and do not wish to have that smell 3 miles away multiplied times 12 (for starters).
It seems unfathomable why a dairy is even being considered for the smell factor alone that close to a major residential area and resort area. Friends of ours from California that live on and operate a dairy there come here to enjoy the **clean** air, and have told us that this year will be their last trip if that dairy goes in.

I am concerned that the EIS study is only being done for the initial 700 cows not the total of 2,000 you plan to have eventually which does not include the calves born each year to each of those cows, nor the bulls to impregnate them. A dairy is never just dairy cows.

The allergins released into the air from high density cattle ranch or dairy such as this are of great concern to anyone with respiratory problems.
The clay soil which will become a toxic nitrate overload, will not settle into the soil as it is clay based and it will be airborne and flow into the canals and reach the sea. This level of nitrates will be toxic to sea life and the reef. I would think this type of pollution would be ripe for the "clean water act". There are lava tubes and all kinds of ways our water table can be completely polluted with that much surface waste from that many cows.

I am afraid of what our home value will be in two years if this dairy goes in. Statistically home values plummet when a dairy goes in within 10 miles. The Hyatt is the islands biggest employer. Many other businesses depend on the Hyatt guests and all of those that stay at the adjacent Poipu Kai resort to support their businesses. A friend of mine is in charge of corporate sales at the Hyatt. They have already had to lay off employees for banquets that will not be happening due to loss of corporates reservations this year and the next who would rather not spend $200 to golf next to a smelly dairy, or subject their employees to beaches that have run-off from animal waste from a dairy or the bot flies that come with dairy cows that will bite them while they try to sunbath.

The water quality will be degraded for all of us who enjoy water sports on the South shore as the current takes what ever washes out of the stream in Mahalepu to Poipu Beach where our children and Island guests swim.
Our ground water will be degraded as it has when wells are within short distance of dairies holding tanks which always leak. One of our major wells is only 700 feet from one of the open air hold-

ing tanks for excrement. The waters infront of Gilian house are already some of the most toxic in the state from the 30 or 40 head of cattle grazing in the valley presently, in addition to some wild pigs, and nearby horses stables at CJM. I would think that would be a red flag to those who are not paying attention to the clay rich soil in this flood zone you want to put a large dairy on, and how much worse it will be if 700 and then 2,000 cows are each adding 110 lbs of urine and feces per day.
I am upset that HDF has not been truthful or transparent. Our wells are never on their maps at meetings and this all seems like it was hush hush and no one knew about it for years but the mayor and Grove Farm until last spring. The owners of the Hyatt did not know about it until April!!!! HDF has misrepresented its "experts" such as Dr. Chin Li at UH who never advised you about grass type, or planting. I can't help but wonder who else has been mis-quoted among your experts. Regardless of your mis-information at some of our meetings, all of us who live here know which way the winds blow, and three miles away from the diary at our home we will be sure of it if this all comes to pass.

I have a horse, she has 4 acres to roam around in. I can't imagine her sharing a pasture with 400 pasture mates even for a few hours and then to think of what the ground would look like in her pasture with that many pasture mates' urine and feces in addition to them surely eating everything in site within hours most likely. It is not rocket science that this makes no sense. The "New Zealand model" you keep waving your flag about seems to be a stinker too. From what I have learned, New Zealand has had to close beaches because of the toxic nature of their ocean front dairies, and I have yet to hear any positive reports about them. Friends that have traveled there can attest to the smell and the stinky sludge on the beaches near dairies. You have provided no expert advise that the grass planned will regenerate supernaturally with that many cows eating it each day nor have they provided a plan that the 200,000 pounds of daily manure and urine will stay on your leased property even when we have 40 days of constant rain some winters and flash floods that give no time for normal soil to absorb moisture - let alone the clay soil of Mahalepu which absorbs very little. My father lives near us and has his degree in soil science. He is very upset that the clay soil has been all but ignored in the HDF plan. I find it highly suspect this seems to be down played in the consideration of where this dairy is to be considered.

I feel the stakes are too high for one wealthy mans gamble at being a "cutting edge" dairy owner. Please have him experiment some where away from homes, waterways and the ocean, where he has more land for that many cows. People who save their whole lives to visit somewhere clean and beautiful should not be met with a toxic excrement smell when they get out of their car. People who have worked hard to live here should not have their livlihoods shattered by the smell and pollution of a dairy a few miles away taking away their livelihoods.

People choose Kauai because they want a clean, green, vacation. They don't want to worry about their health when they go to the beach, they want to breath clean fresh air, and not have biting flies to swat at the beach.

Please consider those of us that live here, we don't want to have to move, this is our home.

Mahalo,

Shari Pilaria
2551 Ala Kinoiki
Koloa, HI 96756

808-652-1664

GROUP 70 INTERNATIONAL

May 26, 2016

Shari Pilaria
2551 Ala Kinoiki
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 Shari Pilaria:

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.

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.

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

RECEIVED
FEB 24 2015
GROUP 70 INTL

February 21, 2015

To Whomi it may concern,

Aloha,
I am a concerned resident of Koloa and have some concerns that need to be addressed and answered regarding the proposed Dairy in Koloa Hawaii. My name is Val Pilaria and my email is: ISellKauai@aol.com. My address is P.O. Box 1235, Koloa, HI 96756.

My concerns and comments are as follows:

(1) Why Koloa and why Mahalupu which is such an important part of our island? I am originally from the mid west and spent several years in California and I know there are better places for a dairy than here. If you wanted it on an island, Why not somewhere on the big island where they won't be impacting residents close by or Kaholawwe?

(2) I am not against Dairy at all and know they are needed but not here. Kauai is small and have you even considered the impact on businesses and hotels here? We were in Hemet California last month and when we returned to our hotel, there was an undeniable stench in the air that was very strong. We had arrived the night before and didn't notice it and had gone to a meeting and when we returned the next day, there was this foul odor at our beautiful hotel. We asked what it was and the desk clerk apologized and said it was from a 500 cow dairy four miles away! She said it only happens when the winds changed which they did that particular day.! So here we have the Hyatt hotel and all the condos nearby. People who work at the hotel have mortgages to pay and if this does what many expect to happen, the rooms will no longer be full and the people will be losing their jobs and won't be able to pay their mortgages. Some employees have been there for twenty

years! Condo owners will have a lower revenue once the word gets out and they will lose their investments. All this for the 15 jobs the Dairy is said to have for locals! Why Kauai??

(3) How are you going to handle the potential contamination to our wells that are near the Dairy and are vital to Koloa?

(4) Rumor has it that the milk is not going to be processed here and will leave the island for other parts and perhaps even China.? How are HDF's claims that milk will be cheaper here going to become a reality? I, for one, would prefer to pay the higher prices for milk and protect our Kauai from contamination to our air and our waters.

(5) We have horses and it takes a minimum of one acre per horse on good pasture to sustain a horse. When I hear the numbers of cows per acre you plan to put on grass, it is hard to imagine that many confined to a small pasture without much room to move but there will be plenty of urine and manure there. 60 acres for 2000 cows (we were told this last night at the meeting) for 22 hours a day. If they were using all sixty acres of grass that would amount to .03 acres per cow but if you are rotating as you said you are there will be many more cows per acre. It will exceed the 100 cows per three acre pasture by far and if you didn't rotate and used the whole 60 acres, thirty-three cows per acre is not reasonable. I am looking out on my four acre parcel with my one horse eating the grass and imagining 330 cows out there with her is mind boggling to say the least.

(6) There was a couple fromthe North part of the island at the meeting last night. They have spent a few years in New Zealand and they can tell you how the Dairy there did not work and it has polluted the waters there. I believe they spoke at an earlier meeting a few weeks ago.

(7) I hope you will listen to the people who live here and care for the aina. Kauai is a special place and we all need to protect it now before it is too late.
Please listen to the people.

I thank you for reading this and would like to be a consulted party.

GROUP 70
INTERNATIONAL

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May 26, 2016

Val Pilaria
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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 Val Pilaria:

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.

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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.

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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.

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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).

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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: PIERRE A PLOTKINS <paplotkins@shaw.ca>
Sent: Monday, February 09, 2015 6:34 AM
To: HDF
Subject: Dairy odor

Follow Up Flag: Follow up
Flag Status: Flagged

What action is planned to mitigate odor problems, to prevent any nauseous odors from leaving the dairy site? (Local residents, visitors, and guests, have a right to not be assaulted by malodorous emanations leaving the dairy site.) Aloha, Pierre A. Plotkins , Kapaa

May 26, 2016

Pierra A. Plotkins
paplotkins@shaw.ca

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 Pierra A. Plotkins:

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:

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Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

RECEIVED
FEB 27 2015
GROUP 70 INTL

James M Poindexter
1565 Pee Rd #112
Koloa, Kauai 96756
poipucondo@cableone.net

State of Hawaii, Department of Health
Virginia Pressler M.D., Director
1250 PunchbowlStreet
Honolulu, HI 96813

Re: Proposed EISPN for the proposed Mahaulepu Dairy farm located in Poipu

Dear Dr. Presser, Director and Interested Parties,

As a resident of Poipu Kai I am a very interested party to the developments that will take place regarding a dairy farm so close to our residential community. In particular there are several areas I am concerned are not being taken as seriously as myself and others feel are of the utmost concern to our community and its inhabitants. Before I list them I must first say that I am happy that the agency has taken a positive step to insure that proper and prudent attention is spent to insure the safety of the community by performing the necessary work in the study. I was shocked that approvals had been given for the dairy farm without them. Thank you!!

1. The impact of the smell and the wind direction must be given particular attention. The proposed dairy farm is within close proximity of our community and if our community were strictly farmland that would be different. As it is our community is of strategic importance as a tourist destination and as such a strong smell (or even mild odor) would be damaging to the attractiveness of the destination and would therefore cause great economic hardship to the owners of the properties and the local families who are employed by the businesses who benefit from the tourism. As I am sure you are aware the Poipu area is located a in a particularly unique location that enjoys sunnier than normal conditions on the island of Kauai and is therefore well suited to tourism and will continue as such provided it does not smell of pungent cow manure. That could dramatically effect the air quality of the area.

2. Another potentially catastrophic concern is where the cows will congregate and get their feed and water and is that area near underground wells that services the local community and schools where children live and play. If there is even a remote chance that the tons of manure that a farm of this size could potentially pollute the underground water supply used as drinking water and so forth, the effects may not be correctable. All care must be exercised that this cannot happen. It is my understanding that several such wells are on the proposed site for the farm. Is there a way this can be accounted for in the proposed plan, according to preliminary studies by local organizations this issue has not properly been addressed?

3. Finally does this type of project conflict with the best possible economic outcome for the area, as a proponent of economic growth I understand the need for the farm and the jobs and economic growth it may create. But if the consequences of the dairy farm to this local area

may cause an even greater loss and economic hardship because of the smell and quality of health to the surrounding area, this cannot be wise! The Poipu beach area must be protected as the residents have already demonstrated a wise use of existing resources.

In conclusion let me say that I am originally from the Midwest part of the United States, I grew up around dairy farms and have always been empathetic to the farmer and still am. I also understand the goals of the legislature to become farming self-sufficient, at first glance this would appear to be a noble and intelligent goal. But great care must be exercised to the water supply, many mistakes have been made in California and the Midwest farm belt that in retrospect the residents wish they had taken more care. Regrettably some communities have become un-inhabitable. We certainly would not ruin a thriving tourist area! Especially if another location were available that did not have the same water or air quality impact potential as this proposed site.

Sincerely yours,

Jim Poindexter
Concerned Poipu Resident

GROUP 70
INTERNATIONAL

May 26, 2016

James M. Poindexter
1565 Pee Road #112
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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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.

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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.

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Water Hydrologic Unit, which features relatively high precipitation with relatively low stream discharge. There are no perennial streams in the Māhāʻulepū watershed.

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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.

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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.

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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: Eve Powers <sacredearth@hawaiiantel.net>
Sent: Saturday, February 21, 2015 12:43 PM
To: HDF
Subject: proposed Maha'ulepu Dairy

Our island is very small and the amount of urine & feces produced by your cattle cannot be absorbed and would ruin one of the last undeveloped ahupua'a on Kaua'i. Please take a longer view with future generations in mind, and do not pollute this pristine area with a dairy in this location. Food sufficiency is one of our island goals, but this dairy will add nothing to that, and is in a very, very wrong location.
Eve Powers
Koloa resident

GROUP 70 INTERNATIONAL

May 26, 2016

Eve Powers
sacredearth@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 Eve Powers:

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,

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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; (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 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, LLC Maha'ulepu, Kauai Project

I wish to provide input now and be deemed a consulted party for future phases of the process regarding the EISN filed in connection with the subject project.

I am a Hawaii resident and homeowner residing about 3 miles from the proposed Maha'ulepu, Kauai industrial dairy location. If allowed to proceed, the planned dairy would have many extremely negative impacts on the Koloa/Poipu area. The EIS must thoroughly evaluate these adverse impacts, such as the two listed below, in full detail.

ECONOMIC CONSIDERATIONS

The quality of life for residents and visitors to the area would suffer dramatically. Odors, flies and noise emanating from the dairy would create a situation wherein what is now the major Visitor Destination Area on Kauai would no longer be a desirable place to live in or visit. Occupancy rates at hotels and other rental units would plummet. The decrease in visitor traffic would also negatively impact area businesses like restaurants and shops dependent on tourist trade. This would harm local business owners, and also lead to a rise in unemployment. The value of **all** real estate in Koloa and Poipu would fall substantially. The resultant decline in assessments would severely impact a major source of Kauai County's tax revenue. County services would need to be curtailed, or the revenue shortfall would have to made-up by raising rates island-wide, or from the imposition of other taxes.

WATER SUPPLY ISSUES

Drinking water for Poipu and Koloa is provided by the County Department of Water from wells located in close proximity to the intended Maha'ulepu dairy location. In many areas where industrial dairy operations have been introduced water contamination events have occurred. The EIS should fully evaluate the project's effects on the safety of the drinking water supply as well as the costs to taxpayers of fixing contamination problems.

An industrial dairy farm in close proximity to major visitor and residential communities would have HUGE consequences – an extremely thorough review is clearly in order.

Allan Rachap
1714 Keoniloa Pl.
Koloa HI 96756

email: allanjudy@gmail.com
phone: 808-742-1001

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

Allan Rachap
1714 Keoniloa Place
Koloa, HI 96756
allanjudy@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 Allan Rachap:

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 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.

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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 23 2015

GROUP 70 INTL

February 21, 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, LLC Project

I am a full-time resident of Hawai'i, living in the Po'ipu area of Kaua'i. I would like to be added as a consulted party, as my comments, below, relate to the EISPN filed by Hawaii Dairy Farms.

Based upon information I have received from expert and reliable sources and based upon irrefutable facts which have been brought to light, I have come to the conclusion that the proposed site is a terrible location for the operation of an industrial dairy. I am amazed and appalled to realize that the parties involved – Hawaii Dairy Farms, LLC and Grove Farm, Landlord – would even consider such an operation in this sensitive area and then, contrary to very strong community opposition and with complete disregard for negative effects to the environment, would attempt to continue with their plan.

I call upon the State of Hawaii Department of Health to uphold its Mission Statement: "The mission of the Department of Health is to improve the health and environment for all people of Hawai'i." And further, to endorse its Philosophy: "Health, that optimal state of physical, mental, social and environmental well-being, is a right and responsibility of all of Hawaii's people." The citizens and residents of Kaua'i are exercising our responsibility, as explained in your "Philosophy." Now, the Department of Health must do its part.

The potential negative consequences of this misguided and ill-conceived venture are frightening: drinking water contamination, noxious smells, economic catastrophe, pollution of Waiopili Stream and the Pacific Ocean, biting flies, impact to Hawaiian cultural practices, to name just a few.

It is imperative that the Hawaii Department of Health deny any permit or request for this dairy to operate in this location. Failure on your part to do so is likely to produce dire consequences, impossible to "fix" after operation has begun. Please do not let this devastation to our pristine environment occur. Thank you for your consideration of my viewpoint.

Judith G. Rachap
Judith G. Rachap
1714 Keoniloa Place
Koloa, HI 96756
Phone: 808.651.8123
E-mail: judyrachap@yahoo.com

cc: Hawaii Dairy Farms, LLC
PO Box 1690
Koloa, HI 96756-1690

cc: Group 70 International, Inc.
925 Bethel Street – 5th Floor
Honolulu, HI 96813

GROUP 70 INTERNATIONAL

May 26, 2016

Judith Rachap
1714 Keoniloa Place
Koloa, HI 96756
judyrachap@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 Judith Rachap:

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 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: Robert Ray
To: HDF; epo@doh.hawaii.gov
Subject: Questions Re: Environmental Impact of Maha"ulepu Dairy
Date: Monday, February 23, 2015 6:42:41 AM

Questions Regarding Environmental Impact Statement
Maha'ulepu Dairy

Bob Ray, February 2015, bobrayiii@hotmail.com

I have attended several Koloa Community meetings on the proposed dairy.

Here are my questions for writers of the Environmental Impact Statement for this project.

First: acidification. Waterborne wastes from streams may flow into the ocean where reefs might absorb some nutrients and open ocean dilute the rest. But problems such as acidification might persist. An example of this acidification could result in Australia's Great Barrier Reef dissolving into a wider and deeper Coral Sea.

What procedures will the dairy operators take to mitigate acidification of local water?

Second: baseline figures on various coliforms offshore. A member of the Kaua'i Surf Association told the Koloa Community center audience about results of water sampling in the shorebreaks of beaches around the island. Samples near the Gillin house on Maha'ulepu beach showed the highest levels of animal and human waste on the island of Kaua'i.

What are the results of dye flushed down the toilets of the Gillin house to see if coliforms stay in the drain field or shows up offshore?

Third: Grassed waterways and terraces. Grassed waterways and terraces have been shown to control pollution several ways. They can stop erosion, and keep runoff away from beaches, away from swimming areas, away from reefs, away from open oceans. And grassed waterways can keep percolation from polluting well water.

What are the percolation characteristics now, and what procedures will the operator undertake to maintain the slope and the percolation characteristics of the topsoil?

Fourth: backup operators. The operator has to work at best practices every day. If he quits or goes on vacation, someone has to do the job or inspectors will write you up and neighbors will complain that you are not really serious about controlling pollution.

What insurance policy, performance bond, or backup staff will the dairy use to ensure continued best-practices operation?

Fifth: Litigation. Can Poipu neighbors sue Grove Farm as owners of a polluting nuisance? And win? Can critics avoid court by writing contract procedures to operate pollution control systems according to best practices?

Sixth: Engineering Solutions and Performance Bond. Engineers treat pollution control like puzzles. They solve puzzles by building primary sewage treatment plants. If that leaves some unsolved puzzles, they add a secondary treatment plant. For remaining puzzles, for either municipal or industrial wastes, engineers add a tertiary treatment plant. Taxpayers and stockholders don't like the expense.

Money in the bank for one polluter can be many multiples more than another polluter, but their pollution solutions can break the bank for either one of them.

Will the dairy post a bond to insure that the acreage will be returned to its 2014 slope and grass cover if the dairy goes broke?

Seventh: dairy dependence on grass for total digestible nutrients. Lapperts can say "we started with milk." Some dairymen say, "I start by testing cows and looking at bull pedigrees." Parker Ranch cowmen say, "We manage grass." Howie Buffett, in his book "40 Chances" says, "I manage dirt."

Maha'ulepu Dairy is reported to say Kikuyu grass and Guinea grass are the foundation of its business plan. Guinea grass grows all over Kaua'i and is managed as a weed. What are the total digestible nutrient characteristics of Guinea grass? Do cattle eat enough of it to make milk?

In Kenya, native Kikuyu grass grows in deep soil in temperatures ranging from the 40s to the 90s. In Kokee, Kikuyu is invasive and grows in damp soil in temperatures between the 30s and 80s. At the Santa Rita Experiment Station, outside of Tucson, Kikuyu has grown over 50 years in parched soil at temps between freezing and 100. The dairy expects the same success claimed by New Zealand dairies which plant Kikuyu. The question isn't "Do these soil and temperature ranges make the dairy impossible in Maha'ulepu?"

The questions are, "Can Kikuyu grass thrive in shallow soil at temperatures between 65 and 85 in Maha'ulepu? And can cows thrive on it and produce enough milk to make money? And does it taste good to cows? Does it make good hay with the right balance of total digestible nutrients? Does it improve soil? Can the dairy manage the dirt? Can the dairy cope with rain delays in spreading liquid waste? And cope with windborne odor as well as the sewage treatment plant 50 yard west of the Hyatt spa?"

Kikuyu extends runners along the ground, which is good for erosion control.

This growing aspect nourishes grass roots and may improve soil tilth.

What are the results in tonnage of harvest, palatability of hay, and pounds of milk? Can Guinea grass supply nutrients Kikuyu grass lacks?

A golf course greenskeeper or a farmer can control odors and storm runoff if he can use things like carbon dioxide, nitrates, and phosphates as soil nutrients.

Farming practices can sequester carbon dioxide in soil and growing plants. Nitrates and phosphates bind to soil particles and will stay out of ground water and out of runoff when farmers terrace the slopes and when they maintain grassed waterways – or fairways.

Compounds such as CO2, CH4, NH4, and P2O5 are called "nutrients" because these chemicals make algae bloom or make coral die if you let them into water. They're nutrients for any organism containing chlorophyll. Recently, researchers have added CO2 onto the list of other things that we don't want to get into the water where it acts like a nutrient and upsets the pH balance between acid and alkali.

The Maha'ulepu Dairy has a building permit to terrace the land, and fence the streams to keep cows out of the floodplain, and fence the pastures for rotation to give the grass a chance to recover from heavy grazing. Next, they need an operating permit.

Can inspectors can revoke the operating permit if the operators don't follow procedures?

Eighth: Odor Control. Can the dairy control odors as well as the sewage treatment plant situated 50 yards west of the spa at the Hyatt Resort and Spa?

GROUP 70 INTERNATIONAL

May 26, 2016

Robert Ray
bobrayiii@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 Robert Ray:

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.

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).

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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 24 2015

GROUP 70 INTL

1941 Poipu Rd
Koloa, HI 96756
February 23, 2015

Group 70 International, Inc.
925 Bethel Street
5th Floor
Honolulu, HI 96813

Dear Sir,

We are writing as we are concerned about the possible affects a dairy farm would have in the Maha'ulepu area. This is one of the most pristine and historic sites on the island of Kauai. Many go there for re- creation - a time to restore their energy by being in the beauty of the crystal waters - with family and friends. On one visit everything was decorated for a wedding to take place. It is truly a scared place. With the introduction of cows, we are very concerned about the run off produced by their urine and feces plus the smell that accompanies these. We are afraid this very fragile, beautiful area would be irreplaceably damaged by allowing the dairy to come to this area.

SIncerely,

Gerald and Hannah Rees

Gerald & Hannah Rees

GROUP 70 INTERNATIONAL

May 26, 2016

Gerald and Hannah Rees
1941 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 Gerald and Hannah Rees:

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.

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.

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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
Principal Planner
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, HI 96813
USA

Re: Hawai'i Dairy Farms Environmental Impact Statement (EIS)

Dear Mr. Overton:

We are writing, as owners of a vacation rental property in Kahala at Poipu Kai on the south shore of Kauai, to raise concerns that we believe need to be addressed and answered by the EIS for the proposed Hawai'I Dairy Farms project in Māhā'ulepu.

There is a very real concern that this facility will adversely affect and contaminate the environment in and around the Māhā'ulepu Valley, as well as the sensitive marine ecosystem of Kauai's south shore. Issues that need to be examined include the likelihood and extent of contamination from manure runoff into surface waters that eventually discharge into the ocean near Gillin's beach, as well as the potential for hazardous airborne contaminants that can impact air quality.

The potential for the proposed dairy operation to substantially affect the economic welfare of the community is significant. There is a very real concern that odours and emissions from the proposed dairy would reduce the desirability of the Poipu area as a vacation and recreation destination, and that this would lead to reductions in the numbers and spending of visitors. This in turn would have a significant negative economic impact on the community and on people throughout Kauai who are currently employed at the various resorts, hotels, restaurants and other visitor facilities in Poipu.

As parties who may be affected by the impact of the proposed Hawai'I Dairy Farms project, we wish to be kept informed of the progress and findings of the EIS and all opportunities for comment and consultation.

Yours truly,

Mark Riley and Ann Simpson
118 Pineridge Road
Carp, Ontario K0A 1L0
Canada
Email: asimpson250@yahoo.ca

GROUP 70 INTERNATIONAL

May 26, 2016

Riley, Mark and Simpson, Ann
118 Pineridge Road, Carp
Ontario K0A 1L0 Canada

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 Riley, Mark and Simpson, Ann:

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 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

RECEIVED
SAFE DRINKING
WATER BRANCH
FEB 27 2015

2-27-15
MH
seanto
EPO

Hello, we are concerned residents in Poipu, Koloa worried about the dairy ranch proposal.

Our names are Mike and Laurie Rose, lrose1980@gmail.com.

We hate to rehash all that you have heard about the dairy but hear are our concerns:

1. Water pollution- Are you aware of the waste excrement that cattle produce?
2. When the land gets fed of, the dust and dirt are a huge problem. Example, trade winds!
3. The devastation to the environment and habitat is irreplacible . Mt. Diablo State Park in Clayton, CA pulled grazing rights from cattle ranchers because of the destruction to the environment and habitat.
4. Odor- we live in No. CA and on occation travel down to So. CA. We pass by the Harris Ranch Cattle Co. on our way down. The smell is so bad we have to roll up the windows and that does not even help. The trade winds blow down from the Mts.. It will bring that stench right to us in Poipu.

Poipu is a vacation destination. What are you thinking? Put this farm in a location that will not impact so many people. It is ridiculous that you are even considering locating this dairy right in the heart of Poipu. Thank you for listening to our concerns.

If you are seriously considering this project, do your homework and visit some ranches that have this same operation .

Mike and Laurie Rose
1552 Pe'e Road
Koloa, HI 96756
Lrose1980@gmail.com

P. O. Box 325
Clayton, CA 94517

L Rose.

GROUP 70 INTERNATIONAL

May 26, 2016

Mike and Laurie Rose
P.O. Box 325
Clayton, CA 94517
lrose@1980@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 Mike and Laurie Rose:

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.

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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.

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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 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.

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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 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

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

Laura McIntyre
State of Hawai'i
Department of Health
1250 Punchbowl Street
Honolulu, HI 96813

RECEIVED

FEB 24 2015

GROUP 70 INTL

Gail C. Rosen
2110 Kaneka Street
Apt 181
Lihue, HI 96766

February 23, 2015

Dear Sir,
I am writing to you because of several concerns that I have that need to be addressed and answered in the EIS for the Hawaii Dairy Farm proposal. I am concerned that the presence of so many cows will negatively impact the ground and surface water of Mahaulepu and on occasion the animal waste will reach the ocean. Because of the smell and potential for introduction of large numbers of flies, it may impact beneficial use of the environment for a large distance from the dairy and the introduction of a new species of wasps, not already existing on Kauai, to curtail the fly population could further impact the beneficial use of the environment.

I am also concerned that the organization that will conduct the EIS is not an objective third party but will gain substantially if the dairy is allowed to go forward. This is makes it very hard for them to perform an objective study.

Thank you very much.

Gail Rosen

GROUP 70
INTERNATIONAL

May 26, 2016

Gail C. Rosen
2110 Kaneka Street, Apt. 181
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 Gail C. Rosen:

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.

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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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: McIntyre, Laura
To: HDF
Subject: HDF comments
Date: Monday, February 23, 2015 2:35:19 PM
Attachments: alison blessing and rober breckenridge.pdf
DOC (7).pdf
Hawai"i Dairy Farms - Opposition Letter 2-18-2015.pdf
hdf - email.pdf
Scanned from a Xerox multifunction device001.pdf

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fyi

-----Original Message-----
From: Pruder, Sina L
Sent: Monday, February 23, 2015 2:24 PM
To: McIntyre, Laura
Cc: Tomomitsu, Mark S
Subject: RE: UIPA REQUEST HDF

Laura,

Attached are the letters that we received for the HDF EIS PN.

Thanks,
Sina

-----Original Message-----
From: McIntyre, Laura
Sent: Monday, February 23, 2015 11:26 AM
To: Pruder, Sina L
Cc: Tomomitsu, Mark S; Kim, Lorrin J.; Wong, Alec Y; Seto, Joanna L (joanna.seto@doh.hawaii.gov)
Subject: FW: UIPA REQUEST HDF

Aloha Sina,
I did not receive this UIPA request.
The way I read the request it is very limited, only asking for our DOH Water Branches comments to the Hawaii Dairy Farm's EIS Preparation Notice.
I think it would be better for the DOH water branches to fulfill the request directly by providing copies of their comments only on the HDF EIS Preparation Notice.
EPO has received and reviewed over 40 emails and many hard copy letters from various stakeholders since the HDF EIS PN was published.
We will be comparing our list with the consultants to ensure all comments are considered in the preparation of the Draft EIS.
Yes, please provide EPO with copies of letters and emails you receive(d) in regards to the HDF EIS PN.
Thanks,
Laura

-----Original Message-----
From: Pruder, Sina L
Sent: Monday, February 23, 2015 10:28 AM
To: McIntyre, Laura
Cc: Tomomitsu, Mark S (mark.tomomitsu@doh.hawaii.gov) (mark.tomomitsu@doh.hawaii.gov); Morikami, Lori N; Wong, Alec Y (alec.wong@doh.hawaii.gov) (alec.wong@doh.hawaii.gov); Seto, Joanna L (joanna.seto@doh.hawaii.gov) (joanna.seto@doh.hawaii.gov)

Subject: FW: UIPA REQUEST HDF

Hi Laura,

Did you receive this UIPA request from HDF? The WWB only received a couple of letters and emails in response to the comments for HDF's Environmental Impact Statement Preparation Notice. Can we provide you with our copies of these letters and emails to include in your request?

Thanks,
Sina

-----Original Message-----
From: Nishioka, Miles
Sent: Monday, February 23, 2015 9:21 AM
To: Pruder, Sina L
Cc: Tomomitsu, Mark S
Subject: FW: UIPA REQUEST HDF

Forwarding what Carroll Cox sent in an email.

Miles Nishioka
State of Hawaii, Dept of Health
Wastewater Branch
919 Ala Moana Blvd Rm 309
Honolulu HI 96814
ph: 586.4294
e-mail: miles.nishioka@doh.hawaii.gov

-----Original Message-----
From: Carroll Cox [mailto:photos@estudioshawaii.com]
Sent: Monday, February 23, 2015 9:21 AM
To: Nishioka, Miles; CARROLL@CARROLLCOX.COM
Subject: UIPA REQUEST HDF

RECEIVED
FEB 17 2015
WASTEWATER BRANCH

115 Poipu Sands
1565 Pe'e Road, Kauai
January 31, 2015

Sina Pruder
Department of Health
Waste Water Branch
P.O.Box: 3378
Honolulu, HI 96801-3378

Dear Mr. Pruder,

We hope with this letter to communicate our extreme concern about the proposed dairy farming activity near Maha'ulepu in Kauai County. Our concerns relate to likely environmental, aesthetic and economic impacts.

Environmental and aesthetic

1) It seems that bacterial counts in the ocean off Maha'ulepu beach, reflective of organic waste runoff, are already persistent at 10 times the upper limits of what are deemed acceptable. This is already the case before the daily contributions of 100's of pounds of cow manure to the lands that feed into that runoff. The current conditions seem to call for efforts to improve rather than aggravate the water quality in an area that supports both recreational activity and a major coral reef already stressed by seawater temperature and acidity changes.
2) The presence of manure and a herd of cows is likely to support sharp increases in the numbers of biting flies and mosquitos into an area that is substantially free of these pests under present conditions.
3) When the wind is unfavorable we are concerned that odors from the dairy enterprise will be bad enough to render the nearby homes and resort areas substantially unpleasant.

Economic

We understand that adjacent Poipu resort activities currently generate about 25% of Kauai's tourist revenue. If the adverse environmental and aesthetic consequences of the dairy farm play out as described above, the area would become much less attractive or valuable as a resort destination. We would be inclined to sell our condominium, even below our original purchase price. If other property owners felt the same there would be a decline in the tax base that would need to be absorbed by the rest of the island – including year round residents. Not to mention the overall decrease in tourist revenue generated by a less attractive destination.

While we understand the rights associated with development of properties by their owners, we think there should be limits to how much environmental harm these activities can be allowed and how much economic harm they can do the economy of the island as a whole.

New Zealand and Washington State, both environmentally sensitive communities, have been dealing with the consequences of this form of dairy enterprise including huge pollution problems. The communities are working to dismantle these operations and mitigate their harmful effects with programs that require the investment of lots of time, effort and money. It would be a shame to repeat and compound those past, well-intentioned mistakes in Hawaii.

Sincerely,

Henry Rosen, Sara Rosen

Henry and Sara Rosen

May 26, 2016

Henry and Sara Rosen
115 Poipu Sands, 1565 Pe'e 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 Henry and Sara Rosen:

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.

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

RECEIVED

FEB 23 2015

GROUP 70 INTL

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Honolulu, HI 96813

Re: EIS Hawai'i Dairy Farms

We hope with this letter to communicate our extreme concern about the proposed dairy farming activity near Maha'ulepu in Kauai County. Our concerns relate to likely environmental, aesthetic and economic impacts.

We identify the following elements among the **EIS Significance Criteria** as being relevant to the HDF project. "In most cases, an agency determines that an action may have a significant impact on the environment if it meets any of the following criteria:"

Substantially affects the economic or social welfare of the community or State;

Substantially affects public health;

Involves substantial secondary impacts, such as population changes or effects on public facilities;

Involves a substantial degradation of environmental quality;

Is individually limited but cumulatively has considerable effect upon the environment or involves a commitment for larger actions;

Detrimentally affects air or water quality or ambient noise levels;

Affects or is likely to suffer damage by being located in an environmentally sensitive area such as .... estuary, fresh water or coastal waters;

Environmental and aesthetic

1) It seems that bacterial counts in the ocean off Maha'ulepu beach, reflective of organic waste runoff, are already persistent at 10 times the upper limits of what are deemed acceptable. This is already the case before the daily contributions of 100's of pounds of cow manure to the lands that feed into that runoff. The current conditions seem to call for efforts to improve rather than aggravate the water quality in an area that supports both recreational activity and a major coral reef already stressed by seawater temperature and acidity changes.
2) The presence of manure and a herd of cows is likely to support sharp increases in the numbers of biting flies and mosquitos into an area that is substantially free of these pests under present conditions.
3) When the wind is unfavorable we are concerned that odors from the dairy enterprise will be bad enough to render the nearby homes and resort areas substantially unpleasant.

Economic

We understand that adjacent Poipu resort activities currently generate about 25% of Kauai's tourist revenue. If the adverse environmental and aesthetic consequences of the dairy farm play out as described above, the area would become much less attractive or valuable as a resort destination. We would be inclined to sell our condominium, even below our original purchase price. If other property owners felt the same there would be a decline in the tax base that would need to be absorbed by the rest of the island – including year round residents. Not to mention the overall decrease in tourist revenue generated by a less attractive destination.

While we understand the rights associated with development of properties by their owners, we think there should be limits to how much environmental harm these activities can be allowed and how much economic harm they can do the economy of the island as a whole.

We are also concerned that the management of HDF have been less than forthright in their communications with DOH and with the general public. HDF appear to have omitted from their EIS Application, key findings from the USDA regarding surface water runoff and soil drainage, namely:

> HDF's Plan, however direct contradicts the findings of the NRCS (a federal agency, the Natural Resource Conservation Service (NRCS), a division of the US Department of Agriculture, that completed a custom conservation study June 5 2014 for the exact site HDF proposes to operate at. The NRCS, "Custom Soil Resource Report". Determined that most of the soil on the Maha'ulepu farm is "very limited" in its ability to absorb animal waste. The NRCS Report further described the majority of the soil as "high" or "very high" risk for run off due to the clay based nature of more than 60 % of the farm soil.
>
> HDF did not disclose the NRCS report or its adverse findings of June 5, 2014, when the filed their Plan with DOH on July 23rd, 2014. Instead, HDF claimed, in their Application, that the farm's soils were well suited for an animal waste operation.

Ironically the best soil drainage on the site appears to be near two county wells that serve Koloa and Po'ipu.

We believe that many features of this project require especially careful scrutiny – with the overall welfare of the broad county and state foremost.

Sincerely,

Sara Rosen Henry Rosen

Sara and Henry Rosen

May 26, 2016

Sara and Henry Rosen
115 Poipu Sands, 1565 Pe'e 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 Sara and Henry Rosen:

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.

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 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: laminarmatt@gmail.com
Sent: Friday, February 20, 2015 4:57 PM
To: HDF
Subject: NSH Comments on HDF EISPN
Attachments: NSH Comments on HDF EISPN Feb2015 to Group 70.pdf; ATT00001.txt

Please consider the attached comments submitted in response to Hawaii Dairy Farms' EISPN for their proposed dairy at Mahaulepu, Kauai.

Mahalo.

19 February 2015

Group 70 International
Attention: Jeff Overton, HDF Project
925 Bethel St., 5th Floor
Honolulu, HI 96813

To whom it may concern:

In response to the Environmental Impact Statement Preparation Notice (EISPN) submitted by Hawaii Dairy Farms, LLC (dated January 2015), I would like to express my significant concerns about the potential impacts of the proposed dairy operation on local water resources, particularly impacts to water quality. As a water resource engineer and hydrologist involved in land and water resource management on Kauai for the past 12 years, I have seen firsthand the degradation of water quality due to cattle grazing and associated land use practices. While I generally agree with the concept of expanding agriculture on the island of Kauai to lessen the island's reliance on imported food, I strongly feel that any proposed new agricultural operations need to be carefully evaluated with regards to site location and potential environmental impacts. I commend Hawaii Dairy Farms, LLC for beginning the process of thorough evaluation through an Environmental Impact Statement (EIS), and I request that the following questions and comments be addressed through the study.

1. What is the expected water quality of runoff from the paddocks (where manure and waste liquids will be applied), given the presence of poorly-drained soils and the frequency of high-intensity rainfall events in the area? Surface runoff from the open fields is inevitable and can be difficult to contain and/or treat for non-point source pollutants. The EISPN indicates that Groundwater Hydrology and Water Quality Technical Studies will be performed as part of the EIS process. The effects of proposed Best Management Practices (BMPs) on non-point source pollutant loading to local waterways should be quantified using the best available science, and appropriate mitigation measures should be identified.

2. How will compaction of soils by grazing cattle be accounted for in the hydrologic modeling and/or analysis in the Groundwater Hydrology Technical Study? Soils in the proposed project area are predominantly fine-grained (i.e. clay) with poor drainage qualities, and soil compaction due to cattle grazing can and probably will significantly reduce the soil's ability to infiltrate rainwater resulting in more frequent surface runoff and higher runoff volumes than under current conditions. Runoff retention/detention strategies should be considered for pasture lands.

3. How will pollutant migration from proposed dairy operations to groundwater be analyzed and/or modeled? What impacts (if any) to groundwater quality are expected due to the proposed dairy? Given the presence of limestone and known Karst features like the Makauwahi cave/sinkhole in the watershed, how will pollutant fate & transport be evaluated for the aquifer underlying the proposed dairy? Portions of the proposed project area are known to have a relatively shallow water table; can vadose zone/groundwater models be used

North Shore Hydrological Services
Matt Rosener, MS, PE, Principal

to show that pollutants such as fecal bacteria and nutrients (e.g. N, P, K) will not migrate through the soil column into local groundwater?

4. How will climate change impacts on local hydrology be addressed in the analysis? We know that future rainfall regime cannot be cleanly predicted from past records, so rainfall parameters used for modeling and/or computations should be based on future rainfall projections that account for increased frequency of high-intensity rainfall events that can produce substantial surface runoff in the proposed project area.

5. What models will be used to simulate rainfall-runoff response and associated non-point source pollutant transport? We know that most hydrologic models have been developed for very different environmental conditions than those found in Hawaii, and many model predictions generally do not track well with observed data. A factor of safety should be used to account for this.

6. Assuming buffer strips will be used between grazed lands and any surface waters present in the proposed dairy area, what model(s) will be used to determine suitable buffer strip width? What other BMPs being proposed can be incorporated into hydrologic modeling to determine their effectiveness in reducing non-point source pollution from the proposed dairy farm? Again, given the significant uncertainty regarding the effectiveness of pollutant load reduction from various agricultural BMPs in the tropical island environment, it is suggested that a factor of safety approach be used in the analysis to site and size BMPs.

It is my hope that through the EIS process, all potential adverse impacts to the sensitive environment surrounding the proposed dairy farm will be thoroughly evaluated, resulting in a plan that will balance the dairy's operational goals and objectives with the need to protect water quality in the area's waterways and the nearshore marine environment. I recognize that if the proposed project is done right, it can provide significant benefits to the Kauai community, but this cannot be at the expense of local water quality or other significant environmental degradation.

Please give the comments and questions included here the proper consideration as the EIS process moves forward. If any clarification of these comments and/or questions is needed, do not hesitate to contact me at (808) 639-2640 or laminarmatt@gmail.com.

Sincerely,

Matt Rosener. P.E.
Water Resource Engineer/Hydrologist
North Shore Hydro

P.O. Box 4032, Port Angeles, WA 98363
(808) 639 2640

May 26, 2016

Matt Rosener
laminarmatt@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 Matt Rosener:

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:

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.

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,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

Linda M. Rozelle

1661 Pe'e Rd, Ste. 2301

Koloa, HI, 96756

RECEIVED

FEB 25 2015

GROUP 70 INTL

State of Hawaii, Dept of Health

1250 Punchbowl St.

Honolulu, HI, 96813

✓ Group 70 International, Inc.

925 Bethel St. 5th floor

Honolulu, HI, 96813

Hawaii Dairy Farms, LLC

PO Box 1690

Koloa, HI, 96756-1690

Dear Ladies and Gentlemen:

I wish to express my grave concern over the prospect of an industrial dairy on the south side of Kaua'i. I have lived in the area for 14 years and have enjoyed the beauty of the water and land. I am concerned about the impact on the ocean, the air, the water supply, and the tourism industry. I am troubled by the use of the word sustainability, since there will be no benefit to the island, with all milk being transported elsewhere for processing. There are few new jobs projected, with numerous jobs at risk, as nearby hotels suffer the consequences of having several hundred cows within a few miles.

I serve on the Board of Directors of a Poipu condominium complex and express the concerns of my fellow owners, as well. Please consider an alternate site for this endeavor.

Yours Truly,

May 26, 2016

Linda M. Rozelle
1661 Pe'e Road #2301
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 Linda M. Rozelle:

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.

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: Charles Rullman
To: epo@doh.hawaii.gov
Cc: HDF
Subject: Hawaii Dairy Farms EIS Comment
Date: Sunday, February 22, 2015 10:49:29 PM

Sirs- The large scale dairy farm proposed by Hawaii Dairy Farms(HDS), to be located in the Maha'ulepo Valley, could have serious impact on clean water and air. Potential environmental impacts include, but may not be limited to, the leaching of nitrates into streams; pollution of surface and groundwater; and, methane gas emissions. Such impacts could seriously damage the environment in the valley and surrounding areas. It's commendable that HDS has volunteered to commission and pay for Group 70 International, Inc. to perform an EIS of the project; but, with such environmental risks it is of vital importance that proposed EIS should be performed by an entity at arms length to ensure the public that the EIS is unbiased in all respects. This can't be done with Group 70 International solely beholden to HDS for payment of its services. To avoid any public perception of bias, the County should select the entity to conduct the EIS and share the cost with of its work with HDS.

Charles Rullman
2640 Puuholo Road
Koloa

May 26, 2016

Charles Rullman
2640 Puuholo Road
Koloa, HI 96756
crullman@me.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 Charles Rullman:

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.

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 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

18 Feb 2015

From: Richard Russell
2230 Loke Rd
Koloa, HI 96756

RECEIVED
FEB 20 2015
GROUP 70 INTL

To: Laura McIntyre, Environmental Planning Office
State of Hawai'i Department of Health
1250 Punchbowl Street
Honolulu, HI 96813

Public Comments to Hawai'i Dairy Farms (HDF) Environmental Impact Statement (EIS) Preparation Notice dated January 2015

Dear Ms. McIntyre,

After review of the subject document I wish to submit the attached public comments.

The intent of my comments is to document potential shortfalls in the content of HDF's proposed Environmental Impact Statement (EIS), based upon the information provided in the Environmental Impact Statement Preparation Notice. The comments are not intended to list all the items that should be in an EIS.

Respectfully

Richard Russell

copy to: Group 70 International, Inc
Hawai'i Dairy Farms, LLC

Comments to Hawai'i Dairy Farms (HDF) Environmental Impact Statement Preparation Notice dated January 2015 by
Richard Russell, 2230 Loke Rd, Koloa HI 96756

1. Request that the EIS specifically address the impact of planned dairy operations on Koloa's water supply. The preparation notice simply states that "Drinking water and irrigation water supply for HDF, and ground water quality will be addressed..". This level of detail is inadequate. In addition, the EIS should:

a. Define the Federal/State/Local public drinking water standards that must be met.

b. State the specific mitigation techniques that will be used to prevent HDF operations from contaminating Koloa F well.

c. Provide the results of studies/analysis required to demonstrate that the proposed mitigation techniques will succeed.

d. Include how government agencies/HDF will monitor the Koloa F well to verify that the output of the well continues to meet public drinking water standards. What substances will be monitored? How often will the well be monitored? How will the public gain access to the results?

e. Estimate the impact to Koloa if, despite their best efforts, HDF operations result in the contamination of the Koloa F well. What will be impact on the Koloa/ south shore water supply? Estimated the cost to the taxpayers (County and/or State) to resolve the problem.

2. Project Schedule

a. The preparation notice states that "Initial operations are permitted to begin with up to 699 cows". Request clarification. Who has permitted HDF to begin operations and when was the permit granted?

b. The EIS should include an estimate of the minimum number of dairy cows required to operate the dairy farm profitably. This information is critical in determining the likely environmental impact of HDF operations. It is clearly pointless (for both HDF's investors and the public) for HDF to operate at a loss. If HDF's operations are economically feasible at a small herd size then environmental risks can be more efficiently managed (operations can expand gradually based

upon the results of environmental monitoring). If HDF requires all 2,000 cows to turn a profit then environmental risks rise sharply. The economic pressure to expand operations, once started, will be enormous; regardless of the actual environmental damage that occurs.

c. The EIS should be conducted assuming a full herd of 2,000 cows (just confirming what I believe the preparation notice already says).

3. The preparation notice states that field trials of Kikuyu varieties are underway at the site. These trials should be completed prior to approving HDF operations. The results of these trials should support any analysis in the EIS regarding supportable herd size or nutrient uptake calculations.

4. General Comment: Any study cited in the EIS should be available for public review. Request the full study with all study assumptions and technical calculations; not just the study summary or conclusions.

5. Recreational Resources

a. The EIS should include the impact of HDF operations on recreational activities at Kawailoa Bay and Gillin's Beach. Kawailoa Bay and Gillin's Beach are important recreational areas for the local community. There is public access to these areas.

b. When addressing recreational impact to the local community the EIS should include all forms of recreation enjoyed by the local community. This includes snorkeling, surfing/body boarding, fishing, spear fishing, swimming and picnicking on the beach.

c. The EIS should assess whether HDF operations could result in beach closure due to high bacteria counts at any beach along the south Kauai shore to include Kawailoa Bay.

d. The EIS should assess whether agricultural odor and biting flies caused by HDF operations will impact the ability of the local community to enjoy recreational activities along the south Kauai shore to include Kawailoa Bay.

6. Water Supply. The EIS should estimate the water consumption required for HDF operations and compare this figure to the current permitted water inflow into the Waitia Reservoir. Will HDF operational requirements exceed existing County

permits for the amount of surface water that can be diverted into Waitia Reservoir? If so then what is the process by which HDF will gain approval to withdraw additional water from public water sources? If ground water will be extracted what will be the impact to ground water levels or the public water supply to Koloa and surrounding communities?

7. Economic and Social Welfare Impact to the Local Community. The EIS should address the impact of agriculture odor and biting flies caused by HDF operations on the economic and social welfare of the Koloa and Poi'pu area, to include:

a. The estimated loss of local employment in hotels, golf courses, restaurant, shops and tour companies due to a reduction in tourist traffic.

b. Estimated loss in State and Local tax revenues generated by the tourist industry.

c. Estimated loss of income of to local business owners dependent upon the tourist industry.

d. The quality of life to local residents (very few of whom live indoors with the windows shut).

8. Additional Agricultural Odor and Biting Flies Comments

a. The EIS should state specifically what actions will be taken to control agricultural odor and biting flies.

b. A clear definition of what is considered an "acceptable" level of odor and biting flies should be developed for public comment. I am unclear if this should be proposed by HDF in the EIS or if the Approving Agency (State of Hawaii, Department of Health) should provide this guidance to HDF up front.

c. The EIS should state how HDF will monitor agricultural odor and biting fly levels. How will the monitoring be accomplished? Where will monitoring be performed? Who will perform the monitoring? How will the public gain access to the results?

d. The EIS should state what action HDF will take if monitoring shows that acceptable levels of odor or biting flies are being exceeded as a result of HDF operations.

GROUP 70
INTERNATIONAL

May 26, 2016

Richard Russell
2230 Loke 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 Richard Russell:

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 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: Joe Sauve <jisauve@olympus.net>
Sent: Friday, February 20, 2015 1:24 PM
To: epo@doh.hawaii.gov
Cc: HDF
Subject: Dairy Farm EIS

Good afternoon the 20th of Feb., 2015.

I attended the community meeting last evening in Koloa Elementary School. The informational meeting was organized so that company people (4) stood one in each corner of the room. It was very difficult to get to them for the crowd. If one could finally get to them the only information given out was the company line, very little real discussion. I have a degree in Soils and one in Entomology as well. I was president of an agricultural company for 24+ years. The EIS will address the water containment and controlled discharge of process water I am sure. I doubt seriously the dairy will have a process water discharge permit as required. This needs to be addressed and confirmed that they were successful in acquiring one. I farmed papaya's (25 acres) on the proposed site. Once in a while we would get excess rain water that would accumulate to more than one foot over most of the land. The perk is very weak in the area, so the excess water ran off. I will again.
Now on another matter the public should see a pro forma operating statement and long term projected income statement. I know the project has that or they would not be investing $ to lose it. This information would project the likelihood of a successful and sustainable operation for 10 years. While no project is guaranteed to be successful, due the serious environmental impact should the project fail and be abandoned, it should be required for the parties to mitigate the impact and be responsible for cleanup to be secured by performance bonds in favor of the County. That would secure a secondary source of recovery to restore the area in that event. This should be an integral part of the FEIS.
I support agriculture and have many years of experience working with farmers. I support Dairy farming as any other Ag. Project. It is the opinion of this writer however that the site selection is basically flawed and better sites could be found that would not be such a hazard to the environment.

Respectfully;

Joe Sauve
742-1558
5143 Hoona Rd.
Koloa, HI

From: Joe Sauve
To: epo@doh.hawaii.gov
Cc: HDF
Subject: Dairy
Date: Monday, February 23, 2015 8:41:12 AM

I attended the Koloa school "community" meeting. Of course it was a Jr. High School show that the dairy should be ashamed of and it was an insult. Now with that aside, I do have experience in developing an EIS and being on the dairy side. One of the things that must be incorporated is the "Wind Rose". It is a computer program that will incorporate NOAA wind data into projections of frequency of odors from all directions on homes businesses and population. The cost is very reasonable and no EIS would be complete without it. To produce an EIS of this project without using this tool would be incomplete, inadequate, irresponsible and unacceptable. We were told at the meeting that all suggestions made would be incorporated in the EIS. I will be looking for it.

Joe Sauve
Koloa

GROUP 70 INTERNATIONAL

May 26, 2016

Joe Sauve
jisauve@olympus.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 Joe Sauve:

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 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.

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: Monday, February 09, 2015 2:03 PM
To: William Schimmelfennig
Cc: HDF
Subject: RE: HDF

Follow Up Flag: Follow up
Flag Status: Flagged

Aloha,
Thank you for your comments. I have forwarded them to the consultants preparing the DEIS for review and consideration.
Mahalo,
Laura

From: William Schimmelfennig [mailto:wschads@hotmail.com]
Sent: Monday, February 09, 2015 12:53 PM
To: EPO
Subject:

I've hunted in that valley back in the day and have seen that whole lower section under a foot plus of water. in the 80's, when I worked in the fire dept. we saw a huge waterfall coming off of Mount Haupu. That was on the Koloa end of that valley. Where do you think that water went but in the area where the dairy wants to be.

Submitted by,

William Schimmelfennig

Sent from Windows Mail

May 26, 2016

William Schimmelfennig
wschads@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 William Schimmelfennig:

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.

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.

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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

-----Original Message-----
From: Ken Schwartz [mailto:k-vision@earthlink.net]
Sent: Tuesday, February 03, 2015 4:47 PM
To: McIntyre, Laura
Cc: HI Office of Environmental Quality Control; DOH webmaster
Subject: Hawaii Dairy Farms EIS

Dear Ms. Pressler and Ms. McIntyre

Re: Hawaii Dairy Farms Environmental Impact Statement Preparation Notice

We received a letter from our Homeowners Association in Poipu, Kauai to contact you directly regarding questions and comments about the upcoming Hawaii Dairy Farms Environmental Impact Statement.

It is our understanding that the entire State of Hawaii is defined to be within Coastal Zone Management Area (Hawaii Revised Statutes (HRS) Section 205A-1, and as such the proposed project must meet with the objectives and policies of the Coastal Zone Management Program, which are binding on all agencies. (HRS Section 205A-4(b)).

The Hawaii Coastal Zone Management (CZM) Program includes the Coastal Nonpoint Pollution Control Program (CNPCP), established through Section
6217 of the CZM Act, is administered through the National Oceanic and Atmospheric Administration (NOAA) and the Environmental Protection Agency via CZM programs and networked agencies. The program, as you know. strives for increased coordination between coastal zone managers and water quality experts to reduce polluted runoff in the coastal zone by focusing on pollution prevention, minimizing the creation of polluted runoff and encouraging pollution prevention efforts at the local level.
The CNPCP sets forth various management measures for a number of categories including wetlands, riparian areas and Vegetated Treatment Systems (VTS).

We suggest that CZM/CNPCP oversight in the areas of pollution runoff and in particular with Vegetated Treatment Systems should be a part of the Review and Approval process and as such these Agencies CZM, CNPCP should be included in Section 2.6 (Required Reviews, Permits and
Approvals) for the HDF Environmental Impact Statement.

We look forward to your comments.

With Aloha,
Ken and Stephanie Schwartz
Poipu Sands #534

http://oeqc.doh.hawaii.gov/Shared%20Documents/EA_and_EIS_Online_Library/
Kauai/2010s/2015-01-23-KA-5E-EISPN-Hawaii-Dairy-Farms.pdf

GROUP 70
INTERNATIONAL

May 26, 2016

Ken and Stephanie Schwartz
k-vision@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 Ken and Stephanie Schwartz:

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:

HAWAI'I COASTAL ZONE MANAGEMENT PROGRAM: Draft Environmental Impact Statement (EIS) Section 5.1 addresses the project's consistency with the Coastal Zone Management Act (CZMA). In 1972, the Federal government enacted the CZMA to effectively manage, use, protect, and develop coastal areas in the U.S. The CZMA was a government response to increasing and competing demands upon habitats and resources of coastal lands and waters. Such demands often resulted in a loss of living marine resources and wildlife; depleted nutrient-rich areas; shoreline

Group 70 International • 925 Bethel Street, 5th Floor • Honolulu, HI 96813-4307 • tel. 808.523.5866 • fax. 808.523.5874 • www.group70int.com

erosion; diminished open space for public use; and permanent and adverse changes to ecological systems. Under the CZMA, States are authorized to work in a unified manner with Federal and local governments to develop programs, policies, evaluation criteria, development standards that lend to the effective protection and prudent use of coastal lands and waters. The enforcement authority for the Federal Coastal Management Program (Public Law 104-150, as amended in 1996) has been delegated to the State of Hawai'i under HRS Chapter 205A, CZM Program.

In 1990, congress enacted the Coastal Zone Act Reauthorization Amendments (CZARA) by adding a new Section 6217 "Protecting Coastal Waters," which requires that each State with an approved coastal zone management program submit a Coastal Nonpoint Pollution Control Program (CNPCP) to EPA and NOAA for approval. The Hawai'i CNPCP follows a Watershed Approach, and activities are coordinated through Hawai'i's Implementation Plan for Polluted Runoff Control and considerations for Stormwater Management.

Hawai'i Dairy Farms is located within the CZMA, which is defined by the State of Hawai'i as encompassing the entire state. The project improvements are designed to conform to the goals, policies, and objectives of Hawai'i's CZM Program. The Proposed Project's consistency with CZMA programs and policies to protect coastal lands and waters is documented in the specific resource chapters in EIS Sections 3 and 4, including significant measures to minimize or mitigate potential non-point source pollution impacts to the aquatic resources and nearshore coastal waters.

Designation of the Special Management Area (SMA) is left to the discretion of each county, provided that the SMA include lands extending "not less than 100 yards inland from the "shoreline" including undeveloped lands surrounding bodies of surface water subject to salinity intrusion or tidal influences and the waters themselves". Per the County of Kaua'i, this project is not located in the SMA.

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: Janette Shablow <shablow@gmail.com>
Sent: Thursday, February 05, 2015 7:33 PM
To: epo@doh.hawaii.gov; HDF; Janette Shablow
Subject: NO TO MAHA' ULEPU DAIRY

Follow Up Flag: Follow up
Flag Status: Flagged

PLEASE DONT LEAVE A LEGACY OF ENVIRONMENTAL DISASTER AND DESTRUCTION OF A PRECIOUS HUMAN RESOURCE. MAHA ' ULEPU. SAVE KAUAI FROM THE GREEDY HUMANS.

May 26, 2016

Janette Shablow
shablow@gmail.com

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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.

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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

RESPONSE TO HAWAII DAIRY FARM'S ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE

February 20, 2015

Dear Sir, Ma'am:

I am very concerned about the proposed industrial dairy at Maha'ulepu Valley. The area around and including Maha'ulepu Beach and Makau-wahi Sinkhole is a treasured recreational area with significant cultural history.

Wai-o-pili Stream is already one of the most polluted streams on Kauai. It would seem more appropriate to deal with the existing environmental problem than to propose making the problem worse. This is a public health problem.

I am in full support of increasing the agricultural production on the island, and making Kauai more independent in terms of food and dairy. There are many other more appropriate sites on the island without risking a major disaster.

The risk of pollution is not just Maha'ulepu, once in the stream or in the wells the risk is to drinking water for Koloa and Poipu. The risk is odor and flies on the South Shore. In addition to the cultural and recreation risk, there is significant economic risk to the entire island. Tourism is a major part of the local economy. Poipu is a significant part of that tourism. As the word of the dairy gets out Kauai will likely suffer a major drop in tourism.

My wife and I have spent our winters in Poipu for more than 10 years and have vacationed here for 16 years. We chose Kauai because of the pristine beauty of the island. Many of our friends and family visited Kauai for the first time to visit us. Most have returned at least once, and many more than once. We feel we have contributed to the economic well being of Kauai. We have friends on Kauai with similar stories. Putting a major dairy farm in a fragile area puts that economic benefit at great risk.

Please find a more suitable location with a lower density of cows. Protect this precious island. Protect the citizens of Kauai. Protect the wildlife in the ocean.

Respectfully,

Jamie H. Shaffer
1565 Pe'e Road #514
Koloa, HI 967566

GROUP 70 INTERNATIONAL

May 26, 2016

Jamie H. Shaffer
1565 Pe'e Road #514
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 Jamie H. Shaffer:

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 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).

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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

1763 Pe'e Road, #503
Koloa, HI 96756
February 23, 2015

Laura McIntyre
State of Hawai'i
Department of Health
1250 Punchbowl Street
Honolulu, HI 96813

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FEB 26 2015
GROUP 70 INTL

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

RE: Proposed Industrial Dairy at Mahaulepu

To Everyone Concerned:

My husband and I are kamaainas. We have owned our condominium overlooking the ocean at Poipu since 1995. We love Kauai so much that in 2006 we gave up our home on the mainland to live here full time. It is has always been our desire and intention to live out the rest of our lives in this home.

Now we are faced with the possibility that this will not be practicable. Our personal concerns are myriad. Based upon the scientific studies we have read, we believe: 1 – our drinking water will be contaminated; 2 – the ocean will be contaminated and unsafe for swimming/snorkeling [one of my favorite activities]; 3 – the ongoing foul odor will be unbearable; 4 – the bottle flies will be a constant nuisance and carry disease; 5 – tourism, the economic lifeline of the south shore, will wither and die; 6 – our financial investment in our home will be totally lost.

We are also concerned about the destruction/extinction of indigenous birds and fish as well as of valuable archeological sites.

We are not opposed to the extablishment of a dairy farm located in a suitable area. We are opposed to an industrial dairy factory located at Mahaulepu.

We are in complete agreement with all of the concerns so well expressed by Charlie Tebbutt, Esq. Please consider his letter [attached] as part of ours.

We are appalled at the "blindness" of the people who are charged with protecting our environment. To date all of the scientific evidence indicating that Mahaulepu is the wrong location for this industrial dairy has been totally ignored.

We were happy to read that HDF will have an EIS done, until we learned that they have selected the same firm that wrote their original proposal [Group 70] to conduct the EIS. THIS IS BLATANTLY A CONFLICT OF INTEREST AND SHOULD NOT BE ALLOWED. We ask the DOH to fulfill its fiduciary duty to the people of Kauai by requiring HDF to have the EIS done by an impartial firm. We further request that the DOH take cognizance of the vast environmental harm that will be done to our island if the plans for this dairy ever come to fruition, and take whatever means are at its disposal to halt this project permanently.

Respectfully,

Dr. Irene R. Sherman
Douglas A. Sherman

Dr. Irene R. Sherman
Douglas A. Sherman

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
1250 Punchbowl Street
Honolulu, HI 96813

Group 70 International, Inc.
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Jeff Overton
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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.

FOM's scoping comments below focus on both the EISPN and HDF's "Waste Management Plan," dated July 23, 2014. 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.

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[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.

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 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%

[2] HDF's characterization of the soils is incomplete and, in many instances, conflicts with the actual NRCS soil survey data.

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 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 (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 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 any 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 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.*

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[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.

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.

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[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.

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 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 irretrievably harmed.

Sincerely,

_____

Charles M. Tebbutt
Law Offices of Charles M. Tebbutt, P.C.

From: Irene Sherman <kauaigirl@bluebottle.com>
Sent: Monday, February 02, 2015 10:54 AM
To: EPO
Subject: EIS for HDF - Mahaulepu

To Whom It May Concern:

My husband and I are full time residents of Poipu, Kauai. We are also members of Friends of Mahaulepu and are appalled at the "blindness" of the people who are charged with protecting our environment. To date all of the scientific evidence indicating that Mahaulepu is the wrong location for this industrial dairy has been totally ignored.

We were happy to read that HDF will have an EIS done, UNTIL WE LEARNED THAT THEY HAVE SELECTED THE SAME FIRM THAT WROTE THEIR ORIGINAL PROPOSAL to conduct the EIS. THIS IS BLATANTLY A CONFLICT OF INTEREST AND SHOULD NOT BE ALLOWED.

We ask the DOH to fulfill its fiduciary duty to the people of Kauai by requiring HDF to have the EIS done by an impartial firm.

Mahalo,

Dr. Irene R. Sherman
Douglas A. Sherman

May 26, 2016

Dr. Irene & Douglas Sherman
kauaigirl@bluebottle.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 Dr. Irene & Douglas Sherman:

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.

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 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 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.

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

From: Eds Mac <e.sindt@hawaiiantel.net>
Sent: Thursday, February 19, 2015 9:40 PM
To: HDF
Subject: Hawaii Dairy Farms EIS Comment

Please advise exactly why the Mahaulepu site was specifically selected for your dairy.

Was it because of less cost for development? A favorable lease arrangement with Grove farms? Access by trucking companies? A conducive environment for the cows that will produce the milk product? Other considerations?

As there are many, many other sites on island that would acommodate a dairy without the public controversy surrounding Mahaulepu with cultural, environmental and proximity to sensitive visitor concerns, common sense should enter into your selection. You folks could be heroes and welcomed by the community. So why this path? Please comment.

I do think your purpose of creating a sustainable ag endeavor on Kauai is very noble indeed. I just can't understand why you would want to create such a public uproar as you have with this ill-thought-out plan and location. There are thousands of acres of suitable land available for a dairy.

Please go back to a more common-sense selection and lets all of us Ag folks working together to make this happen.

Ed Sindt
Kauai Roots Farm
808-651-5520

GROUP 70 INTERNATIONAL

May 26, 2016

Ed Sindt
e.sindt@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 Ed Sindt:

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,

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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.

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.

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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

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Group 70 International, Inc.
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Attn: Jeff Overton, Principal Planner
HDF@group70int.com

State of Hawaii Department of Health
Environmental Planning Office
919 Ala Moana Blvd, Room 312
Honolulu, HI 96814
Attention Laura McIntyre, Program Manager
Laura.McIntyre@doh.hawaii.gov

14 February 2015

Re: Proposed Hawaii Dairy Farm (HDF) on Kauai

Dear Mr. Overton and Ms. McIntyre:

I am the owner of Unit 422 in the Poipu Sands condominium project near the proposed location of the HDF and a part time resident there. I am also a board member of the Association of Apartment Owners of Poipu Sands. I believe Poipu Sands is the closest condominium project to the proposed dairy farm. As such, I have followed the debate regarding the proposed dairy farm at Mahaulepu. I might note that late last year, the Board of Directors of Poipu Sands unanimously voted to express our concern with respect to the HDF and to support the lawsuit brought by the owner of our neighbor, the Grand Hyatt Kauai, demanding that a full environmental assessment be done before permits be granted to the HDF.

While I would not pretend to be an expert on environmental matters, I have been extremely concerned with the news that I have read with respect to the possibility that the proposed dairy farm could cause enormous environmental damage to the areas adjacent to it. While I was pleased to hear the news that the HDF had agreed to have an environmental impact statement prepared, I am concerned whether this statement, paid for by HDF and done by a consultant of HDF's choosing will, in fact, present an objective, unbiased view of the potential environmental impacts of the dairy farm. Having been a Vice President of a Fortune 50 company for over 15 years, during which I had many occasions to deal with consultants hired by my company, my experience is that such consultants, almost without exception, produce reports along the lines that their clients desire.

I would strongly urge the Department of Health to very closely scrutinize the environmental impact statement which will be performed by Group 70. Furthermore, I would urge the Health Department to have its own independent, objective environmental statement prepared regarding potential impacts of the HDF. If even a tiny percentage of the concerns expressed about the HDF prove to be true, the HDF could have a catastrophic impact on large sections of Kauai, including the area where my condominium is located. The Department of Health should take all such potential concerns very seriously before considering approval of the HDF operations and if, indeed, any of the expressed concerns have validity, approval of the HDF should be denied. While I believe it may be possible for a scaled down version of the HDF to operate without the hugely detrimental effects which have been identified, given the sensitive nature of the area where it is proposed, it is not at all clear to me that that even a scaled down version of the HDF should be permitted.

Obviously, Group 70 and the Department of Health are both fully aware of the potential environmental concerns that have been identified. However I believe it is important for both the government of the State of Hawaii, and the government of Kauai County, to take into account the potential economic consequences of allowing the HDF to operate. Kauai's natural beauty is of course, hugely important to the tourist trade and allowing an unspoiled wilderness area to be turned into a source of tons of animal excrement on a daily basis, with no place to dispose of this filth in a an environmentally safe manner, would be an extreme mistake. Again, if only a tiny percentage of the postulated harms occur, it would have a devastating impact on the tax base of the Poipu area of the island which, of course, contributes substantially to the tax revenues for Kauai County.

If a mailing list is maintained of those who have expressed their views to Group 70 and the Department of Health please add me to it.

Sincerely,

Stephen E. Smith

May 26, 2016

Stephen E. Smith
400 E. 3rd Ave., #1002
Denver, CO 80203
stevesmithadr@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 Stephen E. Smith:

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: 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.

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.

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.

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: Eleanor Snyder [mailto:mehitibel@gmail.com]
Sent: Tuesday, February 17, 2015 4:36 PM
To: EPO
Subject: Dairy Farm at Maha`ulepu

Please do not allow this huge latrine to foul this beautiful and sacred site. The milk isn't even intended for island use. We don't need a dairy in this wonderful area. There must be other sites on the island that are more appropriate.

--
Aloha,
Eleanor Snyder
P.O.Box 389
Lawai, HI 96765

808 332 7988

GROUP 70 INTERNATIONAL

May 26, 2016

Eleanor Snyder
PO Box 389
Lawai, HI 96765
mehitibel@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 Eleanor Snyder:

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The following responses are offered to your comments:

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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

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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

February 20, 2015

RECEIVED
FEB 24 2015
GROUP 70 INTL

To: Laura McIntyre
State of Hawaii
Department of Health
1250 Punchbowl Street
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From: Norma Doctor Sparks
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I was born and raised in Koloa, Kauai, Hawaii. My parents bought our property in 1949 and established one of the first adult nursing home in Hawaii on this property in 1957. For over 30 years, my parents provided this service to many families on Kauai.

When I was growing up in Koloa, I spent a lot of time at Maha'ulepu with friends and family. Although more rugged than Poipu, Maha'ulepu provided hours of fun. A couple of years ago, I moved back to Kauai to my childhood home in Koloa, which is within a short distance of the proposed industrial dairy. In addition to the harm to the Valley, I am very concerned about the dairy because most of our tradewinds that cool our home come from Poipu and Maha'ulepu and I worry that that the air quality from a large dairy will make our home unlivable.

The construction and operation of a 2,000 head dairy farm on Kauai's south shore will cause irreparable environmental, economic, and social harm. This harm far outweighs any of the alleged benefits of a large dairy on Kauai, especially since the milk produced by the herd will need to be shipped off Kauai for processing and bottling.

I ask that the Department of Health use the EIC process to consider fairly and objectively whether the proposed 2,000 head (not 699) Dairy should be approved in light of the environmental, social, economic, and culture impacts. The EIS should require the following:

1. The Dairy must research the various local, state, and federal ordinances, statutes and regulations that may impose additional requirements. The Dairy did not list the Endangered Species Act but must meet the requirements of the Act because there are at least four native bird species that have been identified as endangered.

2. 2,000 animals should be the number that evaluated throughout the EIS process.

3. Specific information on the impact on the environment by the waste of the cows. The EIS should specifically detail how the waste will be handled, especially since the Dairy will dump the waste directly on the land that it has secured for grazing.

4. Specific information on the contamination of surface waters and the waters that eventually will discharge into the ocean. Specific information on the Dairy's analysis or explanation for how it will prevent surface water discharges. The Dairy must explain the steps it will take to eliminate discharge if manure-related pollutants are detected. The Dairy must detail how it will meet the requirements of the Clean Water Act for manure-related discharges into surface waters.

5. Specific information on the soils capacity for disposal of manure through irrigation. The Dairy 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 protects the environment. The Dairy should be required to provide specific information on the soil's high susceptibility to surface water runoff, that is to detail how they will protect surface water and the ocean when excess water left on a field from manure applications and/or irrigation water applications can transport water and the manure constituents contained in the water.

6. Specific information on how the Dairy will prevent manure-contaminated water from flowing into the low points of the ditches and canals and following the topography of the site to flow into the ocean since water naturally flows downhill as is the case of the site of the Dairy.

7. The Dairy should explain in detail how its lagoons will be sized to deal with a 24-year, 24-hour storm in addition to the average monthly rainfall. The Dairy should be required to detail how it anticipates the environmental and economic impacts of a catastrophic weather event, lagoon breach, or other severe emergency that would be the worst-case scenario at the proposed dairy. The Dairy should detail the potential harm to the environment, even if it executed an emergency response.

8. The Dairy should analyze and provide in detail the problems that manure will create for the environment and humans. These include but not limited to excess phosphorus in surface waters that can lead to eutrophication; bacterial contaminants such as E-coli and fecal coliform that can render surface waters unsuitable for consumption, recreation, and other uses; and nitrogen that can move into surface waters, and from there, percolate into the underlying aquifer, rendering the groundwater unfit for human use.

9. The Dairy should be required to undertake an intensive groundwater study to determine the fate and transport of nitrate to the underlying aquifer. The Dairy should be required to install multiple groundwater monitoring wells both upgradient and downgradient of the facility to monitor whether the dairy is impacting the groundwater.

10. The Dairy should be required to prove before it starts that it can apply all of the manure generated by its herd on the land at agronomic rates and that excess nutrients will not escape the property. The Dairy must be required to prove that the Kikuyu grass will use all of the nitrogen supplied by manure application applications and will not contaminate the groundwater.

11. The Dairy should detail an extensive air modeling survey to evaluate the impacts its facility will have on nearby residents and tourists. The survey should analyze each contaminant to determine its potential impacts on residents and the environment. Because our tradewinds come from the Poipu and Maha'ulepu areas, we are especially concerned of the very well documented noxious odors created by large dairies. The horrendous smell of the Dairy will negatively affect our enjoyment of our property, our home, and the beaches of Poipu and Maha'ulepu.

12. The Dairy should detail its impact on the local economy. The Dairy should detail its impact on our home and property values if the large Dairy is operating just a few miles away. The Dairy should conduct a thorough evaluation of the effects that a large Dairy will have on land and home values in the area. The Dairy should thoroughly evaluate the ways in which the Dairy would affect the thriving tourism industry on Kauai.

13. The Dairy should detail the potential public health threats by the proliferating populations of rates, mosquitoes, biting flies and other pests including creating a nuisance and increasing the risk of transmission of diseases.

After the Dairy submits a thorough study, I feel certain that the State Department of Health will not approve the establishment of a Dairy on Kauai and in the Maha'ulepu Valley. Kauai and Maha'ulepu are extremely poor locations for intensive, industrial large dairies. These lands should be preserved and protected, not irretrievably harmed.

Thank you for your consideration.

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 Norma Doctor Sparks:

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.

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 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 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 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 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

February 20, 2015

RECEIVED

FEB 24 2015

GROUP 70 INTL

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From: Stephen A. Sparks
P.O. Box 1107
Koloa, HI 96756
ndsparks@yahoo.com

I have been visiting Koloa, Kauai, Hawaii since 1968. With my wife, who was born and raised in Koloa, I have learned to value Maha'ulepu Valley.

A couple of years ago, I moved back to Kauai to my wife's childhood home in Koloa, which is within a short distance of the proposed industrial dairy. In addition to the harm to the Valley, I am very concerned about the dairy because most of our tradewinds that cool our home come from Poipu and Maha'ulepu and I worry that that the air quality from a large dairy will make our home unlivable.

The construction and operation of a 2,000 head dairy farm on Kauai's south shore will cause irreparable environmental, economic, and social harm. This harm far outweighs any of the alleged benefits of a large dairy on Kauai, especially since the milk produced by the herd will need to be shipped off Kauai for processing and bottling.

I ask that the Department of Health use the EIC process to consider fairly and objectively whether the proposed 2,000 head (not 699) Dairy should be approved in light of the environmental, social, economic, and culture impacts. The EIS should require the following:

1. The Dairy must research the various local, state, and federal ordinances, statutes and regulations that may impose additional requirements. The Dairy did not list the Endangered Species Act but must meet the requirements of the Act because there are at least four native bird species that have been identified as endangered.

2. 2,000 animals should be the number that evaluated throughout the EIS process.

3. Specific information on the impact on the environment by the waste of the cows. The EIS should specifically detail how the waste will be handled, especially since the Dairy will dump the waste directly on the land that it has secured for grazing.

4. Specific information on the contamination of surface waters and the waters that eventually will discharge into the ocean. Specific information on the Dairy's analysis or explanation for how it will prevent surface water discharges. The Dairy must explain the steps it will take to eliminate discharge if

manure-related pollutants are detected. The Dairy must detail how it will meet the requirements of the Clean Water Act for manure-related discharges into surface waters.

5. Specific information on the soils capacity for disposal of manure through irrigation. The Dairy 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 protects the environment. The Dairy should be required to provide specific information on the soil's high susceptibility to surface water runoff, that is to detail how they will protect surface water and the ocean when excess water left on a field from manure applications and/or irrigation water applications can transport water and the manure constituents contained in the water.

6. Specific information on how the Dairy will prevent manure-contaminated water from flowing into the low points of the ditches and canals and following the topography of the site to flow into the ocean since water naturally flows downhill as is the case of the site of the Dairy.

7. The Dairy should explain in detail how its lagoons will be sized to deal with a 24-year, 24-hour storm in addition to the average monthly rainfall. The Dairy should be required to detail how it anticipates the environmental and economic impacts of a catastrophic weather event, lagoon breach, or other severe emergency that would be the worst-case scenario at the proposed dairy. The Dairy should detail the potential harm to the environment, even if it executed an emergency response.

8. The Dairy should analyze and provide in detail the problems that manure will create for the environment and humans. These include but not limited to excess phosphorus in surface waters that can lead to eutrophication; bacterial contaminants such as E-coli and fecal coliform that can render surface waters unsuitable for consumption, recreation, and other uses; and nitrogen that can move into surface waters, and from there, percolate into the underlying aquifer, rendering the groundwater unfit for human use.

9. The Dairy should be required to undertake an intensive groundwater study to determine the fate and transport of nitrate to the underlying aquifer. The Dairy should be required to install multiple groundwater monitoring wells both upgradient and downgradient of the facility to monitor whether the dairy is impacting the groundwater.

10. The Dairy should be required to prove before it starts that it can apply all of the manure generated by its herd on the land at agronomic rates and that excess nutrients will not escape the property. The Dairy must be required to prove that the Kikuyu grass will use all of the nitrogen supplied by manure application applications and will not contaminate the groundwater.

11. The Dairy should detail an extensive air modeling survey to evaluate the impacts its facility will have on nearby residents and tourists. The survey should analyze each contaminant to determine its potential impacts on residents and the environment. Because our tradewinds come from the Poipu and Maha'ulepu areas, we are especially concerned of the very well documented noxious odors created by large dairies. The horrendous smell of the Dairy will negatively affect our enjoyment of our property, our home, and the beaches of Poipu and Maha'ulepu.

12. The Dairy should detail its impact on the local economy. The Dairy should detail its impact on our home and property values if the large Dairy is operating just a few miles away. The Dairy should conduct a thorough evaluation of the effects that a large Dairy will have on land and home values in the area. The Dairy should thoroughly evaluate the ways in which the Dairy would affect the thriving tourism industry on Kauai.

13. The Dairy should detail the potential public health threats by the proliferating populations of rates, mosquitoes, biting flies and other pests including creating a nuisance and increasing the risk of transmission of diseases.

After the Dairy submits a thorough study, I feel certain that the State Department of Health will not approve the establishment of a Dairy on Kauai and in the Maha'ulepu Valley. Kauai and Maha'ulepu are

extremely poor locations for intensive, industrial large dairies. These lands should be preserved and protected, not irretrievably harmed.

Thank you for your consideration.

GROUP 70
INTERNATIONAL

May 26, 2016

Stephen A. Sparks
P.O. Box 1107
Koloa, HI 96756
ndsparks@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 Stephen A. Sparks:

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.

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.

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 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 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: Dreamcaper
To: HDF
Subject: Hawai"i Dairy Farms
Date: Monday, February 23, 2015 9:57:18 AM

We are greatly concerned with the impact that your proposed dairy will have on the surrounding environment and communities in Poipu. Your EIS should address these concerns:

1. Waste getting into the ground water and flowing into the ocean.
2. Diseases breeding in the waste (or the cows) and being transmitted to people and animals.
3. Smells from the dairy flowing into residential and resort communities.
4. Proliferation of flies. (We have heard that you may have a plan to bring in wasps to keep down the fly populations. Really! What impact will wasps have on the whole island?)
5. Degradation of air and water quality from operations.
6. Impact on attractiveness of the area for tourism.
7. Impact on rental income.
8. Impact on housing values.

Steven Stecher
Portia Igarashi
1901 Poipu Rd. #214
Poipu HI

May 26, 2016

Steven Stecher and Portia Igarashi
1901 Poipu Rd. #214
Koloa, HI 96756
ndsparks@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 Steven Stecher and Portia Igarashi:

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 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,

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Re: COMMENTS ON HAWAI'I DAIRY FARM'S ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE, DATED JANUARY, 2015.

Dear Ms. Mcintyre:

My wife, Wendy, and I have had a 37 year love affair with Māhā'ulepu and Kaua'i. By way of background, we first came to Kauai in 1978 on our honeymoon and were immediately enchanted by the Island.

In 1991, which was as soon as we could afford to do so, we purchased our home in the Lanai Villas subdivision of the Poipu Kai development. Our home is the last house on the eastern side of the Poipu Kai development (the side closest to the Grand Hyatt) and, therefore, one of the first single family residential homes that will be impacted if there are any airborne contaminates from the proposed dairy farm.

When we first bought our house my wife and I had two small children and maintained our primary residence in Los Angles. However, virtually every school vacation we would spend on Kauai. Once on Kauai there would be at least a weekly run, hike or bicycle excursion with our

children to Māhā'ulepu. My wife and I are now full time residents on Kauai and still frequently hike or bike to Māhā'ulepu. Any time we have mainland guests a trip to Māhā'ulepu is always on the itinerary. And, even though my sons are now 26 and 28 and no longer live with us, the first thing that they want to do when visiting is hike into Māhā'ulepu.

In addition to enjoying the pristine beauty of Māhā'ulepu my wife are also investors in the Poipu real estate market. In addition to our home we own three lots in the Poipu Beach Estates subdivision. Our intention was to start construction on at least one of our lots this year. However, as explained below, because of our deep concern over the potential negative environmental effects from the proposed dairy farm we will be refraining from actually starting construction on our lots until we know what will be happening with the proposed dairy project.

By profession I am an attorney licensed to practice in Hawaii, Washington and California. For the last 37 years my practice has focused on real estate development and litigation. As a result of my practice I have extensive experience in reading expert reports and the factors that go into appraising real property. Based upon my review of the Hawaii Dairy Farm's draft EIS, information available on the internet and reports and information provided by Friends of Maha'ulepu my wife and I have serious concerns about Hawaii Dairy Farm's draft EIS and in particular its conclusion that "effects to the environment are expected to be minimal."

While I believe that the proposed dairy farm will have a significant impact with respect to all 13 significant criteria considered by your department, our comments will focus on criteria, 4 (substantially affects the economic or social welfare of the community or State); criteria 5 (substantially affects public health) and criteria 11 (detrimentally affects air or water quality).

The Proposed Dairy Farm Will Decrease Public Well Being, Pollute Surrounding Air and Water, and Have a Negative Impact on Tourism and Employment in Poipu

Without having to get overly technical it is a known fact that dairy cows and their excrement smell terrible. There used to be a dairy operation just off Kuhio Highway that you would pass when driving between Kapaa and Princeville. Whenever we made that drive when approaching the dairy we would have to roll up the car windows and essentially hold our breath until we passed the dairy. The thought of having to live with that smell on a daily basis is truly frightening.

My understanding is that the proposed dairy operation in Maha'ulepu will be considerably larger than the old dairy. Even though Hawaii Dairy Farms claims it can operate it without producing noxious smells, given the fact that 2,000 dairy cows will produce more waste than 300,000 people it is a virtual certainty that the smell emanating from the dairy farm will be horrible and that at the very least it will prevent people from hiking, biking and swimming in Maha'ulepu.

Moreover, given the prevailing trade winds, my wife and I are concerned that the noxious smell from the dairy operation will negatively impact the Poipu Bay golf course, the Haytt and even our home. Putting aside the direct impact on our home, any negative impact on the Hyatt's operations resulting from the dairy operations will have a devastating impact on property values in Poipu.

By way of example, several years ago there was an article in the Wall Street Journal commenting on how much of nuisance wild roosters were on Kauai. After the article came out we had a number of people ask us about the article and whether they roosters would be a problem where they were staying and if they should cancel their trip or at least change where they were staying. An article in the media that golfers or guests at the Hyatt were impacted by noxious smells from the dairy would be devastating to tourism and property values in Poipu. With a drop in tourism, local people who depend on major employers in the area like the Hyatt, may quickly become unemployed, and unable to provide for their families.

As to our technical concerns with the dairy, it is well documented in the scientific community that diseases including: "anthrax, brucellosis, cryptosporidiosis, dermatophilosis, Escherichia coli, giardiasis, leptospirosis, listeriosis, pseudocowpox, Q fever, rabies, ringworm, salmonellosis, tuberculosis, and vesicular stomatitis" can be transmitted from cattle to humans via "air (aerosol), by direct contact, by contact with an inanimate object that harbors the disease (fomite transmission), by oral ingestion, and by insect transmission." *See* Pelzer and Currin, Zoonotic Diseases of Cattle [http://friendsofmahaulepu.org/wp-content/uploads/2014/09/Zoonotic-Diseases-of-Cattle-Virginia-Tech.pdf] Hawaii Dairy Farms does not even address the increased risk of disease from cattle in its draft EIS. Beach goers and hikers would be in the surrounding area and would potentially be affected by new diseases from over 2,000 cattle.

Additionally, in California, a study found that cows were a major source of nitrate pollution in more than 100,000 square miles of polluted groundwater. http://www.nrdc.org /water/pollution/ffarms.asp. Pollution from agricultural runoff into water sources during heavy rains already contributes to water pollution in Kauai, and is bound to be a significant problem at the dairy farm. *See* http://thegardenisland.com/lifestyles /health-med-fit/kauai-ocean-safety-report/article_c39c9d9a-93b7-11e3-8c68-001a4bcf887a.html.

Significantly, Hawaii Dairy Farms provides no analysis of how contaminated water will impact the the Māhā'ulepu coastline. Nor does Hawaii Dairy Farms deal adequately in their EIS with the evidence that the topography and geology of the proposed site increases the risks of environmental damage to the coast and our drinking water.

The Proposed Dairy Farm Will Negatively Impact Property Values

Uniform Standards of Professional Appraisal Practice ("USPAP") are essentially the standards applicable for real property appraisal analysis and reports in the United States. In addition to is binding standards there are USPAP Advisory Opinions which provide guidance to appraisers in how to deal with specific appraisal issues. USPAP Advisory Opinion 9 advises appraisers as to how to value property impacted by environmental contamination. Advisory Opinion 9 recognizes that in valuing real property impacted by environmental contamination the appraiser, among other things, should consider what is known as stigma damage. Stigma damages are basically any negative impact on the marketability of property.

The existence of the dairy will negatively impact the marketability of property in the Poipu area. A knowledgeable buyer is going to research the area and undoubtedly conclude that absent a significant discount in price it is not worth taking the risk of buying in Poipu when there

are other equally attractive resort communities that are not subject to potential environmental contamination for a dairy. In other words, a knowledgeable buyer is not going to pay as much money for a resort property close to dairy operation as he or she will for a similar resort property that is not in the vicinity of dairy operation. This is especially true when there is a significant possibility that the dairy operation will create noxious odors, pollute pristine beaches, create health risks and possibly put Poipu's drinking water at risk.

Because of the potential that market values will be adversely affected by the dairy my wife and I are putting on hold the development of our three lots in Poipu Beach Estates. Unless more information is provided by Hawaii Dairy Farms to eliminate the very real concerns of environmental pollution, which the current draft EIS does not even come close to accomplishing, the negative economic consequences on the Poipu area will be significant and will not be counter balanced by the extremely limited economic benefits of the proposed dairy to the Poipu community.

The proposed cattle farm will likely damage public health, the quality of water and air in the surrounding area, and negatively impact the economy and employment of local people in the Poipu area. As Hawaii Dairy Farm's draft EIS has little or no analysis of these important issues and no plans in place to mitigate the damage from environmental contamination we request that the draft EIS be rejected.

Respectfully,

Jerry Stein

Jerry Stein
1646 Kelaukia St.
Koloa, HI, 96756

Wendy Stein

Wendy Stein
1646 Kelaukia St.
Koloa, HI, 96756

GROUP 70 INTERNATIONAL

May 26, 2016

Jerry and Wendy Stein
1646 Kelaukia Street
Koloa, Kauai 96756
jstein6678@me.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 Jerry and Wendy Stein:

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 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

1633 Hamlet Dr
Troy, MI 48084
13.Feb.2015

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

RECEIVED
FEB 17 2015
GROUP 70 INTL

Regarding Hawai'i Dairy Farms – Kauai – Koloa District

Dear Mr. Overton:

We are the owners of a condominium located at 2371 Hoohu Road, Koloa, HI part of the Poipu Kai Resort on the southeast shore of Kauai. We have owned the property since 1989, and have usually visited the island at least twice a year. When on the island, we spend our mornings at Shipwreck Beach which is very close to the condo. When we are not on the island, the condo is rented through a local rental agency – Suite Paradise – and we pay (and have since 1989) the GET and TAT on these rentals. So, even though we do not reside there we are major supporters of Kauai and pay the appropriate taxes to the State of Hawaii.

We are writing this letter to let you know of our concerns regarding the proposed dairy farm at Maha'ulepu. We are very concerned about the approval process which was done very quietly by county leadership – perhaps because they knew there would be concerns. As we are sure you know, it has taken some effort and publicity to get the review that is being led by your office underway, and we welcome your involvement in the review of the proposal and the opportunity to express our concerns.

First – We are concerned about run-off into the ocean and the impact on sea life around Shipwreck Beach and the Maha'ulepu coastline. The proposed location of the dairy is in and area of heavy clay, so rainwater will not be absorbed and will run into the sea with substantial contamination. This will pollute the ocean and change the nature of the fragile Hawaiian environment.

Second – We are concerned about smells and bugs associated with the dairy, given the proximity to South Shore resort locations. It will not enhance the visitor experience and will result in poor publicity and rental problems. People want to go to Hawaii to have fresh air, not farm air. We can remember the time when there was a dairy on the northeast shore of Kauai, nowhere near a visitor location. We always had to hold our breath while driving past the pastures. We worry that the same thing will happen with this farm and that the proximity and trade winds will result in providing an unpleasant experience for ourselves and our guests.

Third – We are concerned that the milk will not stay on the island of Kauai, but will be shipped to Oahu for processing and distribution. So any positive result will not benefit Kauai. I would rather have mainland milk than milk that was shipped twice - unprocessed to Oahu, then processed then possibly returned to Kauai.

Fourth – We do not see a solution that will remove these concerns. While the dairy owners say they will carefully watch for problems, we believe this project – which was approved without any community interaction – should not move forward given the environmental concerns and after the groundswell of disapproval by residents in the area of the proposed dairy farm, once knowledge of the proposal became widespread around the island of Kauai.

So overall, we do not see any major benefits to the proposal and see many concerns. We are sure that your study will highlight these concerns and that following this review, the proposal will be rejected. Your efforts are greatly appreciated.

Sincerely yours,

James and Susan Steinhagen
Owners – Manualoha at Poipu Kai Unit 1001

GROUP 70 INTERNATIONAL

May 26, 2016

James & Susan Steinhagen
1633 Hamlet Drive
Troy, MI 48084

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 Steinhagen:

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 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.

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.

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

Feb. 21, 2015

State of Hawaii
Department of Health
1250 Punchbowl Street
Honolulu,HI 96813

To Whom It May Concern,

I am a resident of Kauai; having lived most of my life in the agricultural valley of Yakima, WA. My parents were orchardists and my husband and I were the 3rd generation of his family to raise hops near Moxee, which lies 6 miles east of Yakima. The Yakima Valley is located in central WA. It is described as high-desert and the weather conditions are rather harsh. i.e. hot summers and very cold winters, low rainfall, and shallow soil for the most part.

4.1 Significance Criteria.
I am aware of the preciousness of soil, water, climate and other factors that create farmland. The soil in the Yakima Valley is very different from the soil here on Kauai. There is an abundance of clay in the WA State soil that prevents rapid absorption of rain, etc., and this often leads to flooding in specific areas. A couple of miles away from the hop ranch, a huge dairy farm began operation. It feeds and milks 5,000 dairy cows on 120 acres. There was an uproar from those living in the area near the area of the proposed dairy, but their concerns were not enough to prevent the dairy from entering the area. Presently, the dairy continues operating. The hop ranch where I used to live, buys truckloads of manure from the dairy, and spreads this manure upon the fields that have been harvested. There has been a positive increase in yield as a result of the manure. Recently, there was found in the manure, an increase in nitrates. Because of the nitrates in the poop, those few hop farmers who do spread the dairy cow manure on their fields, are to be provided information as to the content of nitrates in the waste products. The dairy must now assess not only for the presence of nitrates, but all other types of unhealthy elements. i.e. Hormonal drugs are injected into the cows to speed up lactation; other bacteria need to be identified and studied to ensure the safeguard of the consumers. It will be the responsibility of the dairy to investigate and inform the public of their findings. This new practice will reveal important data about further health concerns associated with spreading cow waste on farmland that produces a commodity to be ingested by the public. Hops are used to flavor beer. If nitrates are found to be increasing in the manure, then the commodity of hops will be negatively affected. Beer drinkers worldwide will also be affected. The economy of the Yakima Valley will be significantly affected in a very negative manner. The last thing any hop grower wants is to have their crops affected by toxins. This would bring a sudden stop to the economic stability.

4.1 Significance Criteria
#7. Involves a substantial degradation of environmental quality.
The proposed dairy farm on Kauai is being met with concern and confusion as to why a venture such as this would even consider the Island of Kauai, let alone the specific area that has been identified to house the cows. The soil on this Island is such that cow urine and wet poop, will be immediately absorbed. The waste will be infiltrating water tables and aquifers. The smell from the cows will be not appreciated by home owners or other businesses nearby. Runoff will enter the ocean. Even if there is a contained pond or lagoon for the urine and poop, the grazing cows will still be urinating and pooping on ground that will allow for the seepage of the cows waste.

In WA State, it is now required to line all ponds and lagoons with a material to prevent drainage and seepage into the land. Still, there have been leaks in the liners. In Kauai, I worry that the ponds/lagoons will overflow when rainfalls take place. And, holding areas such as ponds/lagoons, often begin to create their own specific sludge; creating unforeseen problems in the future.

4.1Signifance Criteria.
#5. Substantially affects public health.
Sunnyside WA, which is located about 20 miles south of Yakima has suffered decades from the large cattle operation located there. It is called the Cow Palace. At this time, there are homes without water, because the urine and poop contain an unhealthy amount of nitrates. The families living in this area contend with awful odors, undrinkable water that is unsafe for infants, children and pregnant women to drink, wind blows dust for miles around when it is dry, flies are a nuisance, etc. Up to the present time, the public/citizens were not informed about the contamination of the water, soil testing, etc., because the dairy owners did not feel the public needed to know their business. At this time, there is a lawsuit against the dairy farms in the Sunnyside area. The people feel it is only fair that they be given information re: nitrates in the water supply for just one example. The dairy farmers do not feel it is the business of anyone as to the actual number of dairy cattle they have, waste lagoon information, soil testing, etc. The public has now filed their own suit against the dairies. Residents have been told not to let children or pregnant women drink the water due to the content of nitrates found in the water.
In this day and age, it is now expected that those involved in farming do so in a manner that is conducive to the health and well-being of those who live in the vicinity of farmland. Increased population has permitted those who want to live in the country to have their personal concerns heard and they want to live as free of pollutants, herbicides, dust, noise from farm machinery as if they lived in town. No one can blame them. Our world is such that the land mass is becoming dissected into plots that ruin any possibility of farming to take place. This is taking place on Kauai. HDF has the goal of implementing a dairy farm on land that is minimal at best to feed cows. The dairy in Moxee mixes a special bran for the cows that consists of 25 different varieties of grain. Cows just don't produce the outflow of milk on grass alone. HDF continues to make the statement that they will have grass-fed cows only. City farmers make similar mistakes. Thankfully, they have jobs that help them with the cost of small farming. HDF has its own financial ability to pay for unseen problems that animals create.

4.1 Significance Criteria
#7. Involves a substantial degradation of environmental quality.
The amount of water used in dairy farming is very significant. The milking shed requires constant cleaning; using significant amounts of water.
The land in Sunnyside, where the Cow Palace is located, is one huge mess from hell! Piles and piles of manure over 10ft tall are located on land that is as dry and firm enough to hold these piles. Flies gleefully cover the land, piles of poop, the cows themselves. Because flies are a problem and bring about disease, sprays are necessary to eradicate them. Methane is another negative by-product of this dairy.

Dairy cows are not treated in a kindly manner. They are kept pregnant, injected with hormones and other substances that increase milk production; the calves are mainly used for veal; and the male offspring of dairy cows usually find an early death as they only cost the dairy money. They are not seen as cost effective. Another disturbing factor surrounding dairy cows is the loss of the calves. If the calf is male, it is usually put down. Veal is made from calves. The dairy cows who gave birth to their calves are often heard bellowing their grief at the loss of their calves. This is common. Dairy cows are not living a life of luxury. HDF has shared photos of the land where the cows will be held. It is pastural and beautiful. What person(s) would want to negatively change this beautiful area of Kauai? I would not be surprised if HDF or some other big business would be willing to put a pipeline across Kauai if they could make money from it! This type of capitalistic behavior is ruining the earth as we have known her. Those individuals involved in this project are naiive if they think the idea of bringing a dairy farm to Kauai is to benefit the people. There are other more important projects that would benefit the earth and its inhabitants. If the people of Kauai were treated the way those who were in attendance at the Feb. 19th meeting, they would see clearly what is taking place.
The land in Sunnyside on which the Cow Palace is located, is a mess from hell. Piles of manure are seen in areas in which the soil is dry and firm enough to hold it; flies cover the ground gleeful in the poop, methane is another by-product that our environment does not need.

Thank you for the time and attention to my letter of concerns. After having lived in the farming industry most of my life, I must share that I understand the frustration of those wanting to simply farm. In this day and age, we must make sure that the foods we eat and other produce are free of nitrates and other unhealthy additives. Our world has changed from small farming practices to large land owning businesses. Large farms seem not to be as concerned about the health practices they need to follow. They have the financial backing to pay off any fines they may incur with their farming practices. They do things their way and hold their ground (no pun intended) as to their farming practices. It is the large landowner and the financially wealthy individuals who seem to only care about the almighty dollar. I am not saying all landowners or all wealthy people. But enough of these individuals still feel it is their prerogative to do as they want and to hell with the rest. This is not going to work in today's world. We all must know what we put into our bodies and how we treat our earth. I have to admit feeling sick about the venture that HDF wants to accomplish.

It is not in the best interest of the people, the animals or our earth to bring a dairy farm to this Island. I do not pretend to know the reason HDF wants to bring the dairy to Kauai. An Island that is small and already has its own problems with population, traffic, etc. Kauai is a green gem in the huge expanse of blue ocean. It is our responsibility to show it respect. Money making ventures such as dairy farms, large development, etc. need to be stopped. It is time. The Island thanks you.

Mahalo,

Nancy Sterns

I am interested in being a consulted party for the draft EIS.

May 26, 2016

Nancy Sterns
6466 Opaekaa Road
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 Nancy Sterns:

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.

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-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

Hawai'i Dairy Farms

MAHA'ULEPU, KAUA'I

RECEIVED
FEB 25 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: Mary Isabella Stone Organization:

Preferred contact Method

Email: MSTONEI3@hawaii.rr.com Postal Address: 2363 Pu'u Rd #3A Koloa HI 96741

Phone: (Optional)

Comments: I want to be a consulting party for the draft EIS for the Hawaii Dairy Farms, Maha'ulepu, Kaua'i at the above name and addresses. I think making a commitment to change the present site/area use of Maha'ulepu, Kaua'i from the top resource base: departure from residential and "tourist destination area" to a food product of milk protein is not viable. Many of our island food cultures, Asian and Polynesian, as well as vegan/vegetarian, and increasingly health-conscious consumers do not use or are decreasing use of animal proteins. I also question the HDF "irreversible commitment" to preventing the destruction and loss of natural and cultural resources. Safeguarding 24 wells, the use of the Waita Reservoir that presently provide water to residents and visitors, the use of the area for both recreational and fishing, a culturally based food protein resource, indicates many additional factors of importance to study. Both natural and man-made unexpected disasters are not clearly studied in the present review. The proposed mitigation actions for long term buildup

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

JHOverton

over

Deadline: February 23, 2015

effects of the effluent ponds, the nutrient recycling and their efficiency systems, plans to add fertilizers to ensure sufficiency in HDF commitment to "grass fed cows" indicate the need/commitment to long term studies and mitigation processes/structures/plans. Also long term studies of a similar nature in the areas of critical habitate use of flora and fauna. Many examples show this lack of study/knowledge negatively effects long term use by current users.

Our small land mass is critically isolated from a wide network of support so that every part of a sustainable system requires careful study.

Examples come from the Mana Plain on Kauai's westside Kekaha area, the New Orleans, LA Katrina Hurricane loss of wetland areas. Recovery takes time requiring our isolated and small base to fall back on careful study of negative consequences.

I definetely feel these are significant considerations to say NO to this current proposal of HDF. Their objectives can possibly be met in another area of Kauai. The probable loss of an important tax basis in the area, natural resoure loss of potable water and a cultural food resource suggests the current plan is insuffient in addressing these problem areas.

I do not support this application of the Hawaii Dairy Farm at Mahiulepu, Kauai.

Mary Isabella Stone 2/23/2015

From: Mary Isabella Stone
To: epo@doh.hawaii.gov
Cc: HDF
Subject: Hawai"i Dairy Farms, Maha"ulepu, Kaua"i
Date: Monday, February 23, 2015 12:44:20 PM

I want to be a consulting party for the draft EIS. My address is: Mary Isabella Stone, 2363 Pu'u Road, #3A, Kalaheo, HI, 96741. email: MSTONE13@hawaii.rr.com

I think making a commitment to change the present use of this site/area as a residential and tourist destination area with its' present tax basis to providing a food product of protein derived from animal milk is not sustainable. A growing population of providing this food resource is based on a faulty premise.
Asian food cultures, vegan cuisines and increasingly health conscious consumers use less dairy o meet their protein needs.
I also question the long term commitment, the "irreversible commitment" of the HDF to the loss of and destruction of natural and cultural resources as safeguarding the 14 wells that provide drinking water to the residents and visitors of that area, the use for both recreational and as afoot protein source from fishing in the ocean where natural of man-made disasters are unknown but very consequential can have one time or builtup of consequential effects is not seen in the proposed mitigation actions of either the effluent ponds, recycling nutrient efficiency systems, additional fertilizers needed to ensure "grass-fed cows" commitment.
Long term ongoing studies need to be started additionally to the area of critical habitat use by flora and fauna. There are many examples where this lack of knowledge and its use had negative consequences for residents of the area. Our small land mass is critically isolated from a wider network of support, every part of a sustainable system requires critical study. The examples of theMana Plain of Kekaha, westside Kaua;i and New Orleans Katrinba Hurrican shows what the loss of wetlands is for critical preservation. Recovery takes time sand our small and isolated base to fall back on makes these studies more urgent.
I definitely feel there significant considerations to say NO to the current proposal of the HDF on Kaua;i. Their objectives can be meet in another area on Kaua'i. The possible loo of tax base, natural resource losses of potable water and cultural food resources suggest current studies are insufficient to meet these underlying problems. I do not support this application at this time for the Hawaii Dairy Farms at Maha'ulepu, Kauai.

May 26, 2016

Mary Isabella Stone
mstone13@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 Mary Isabella Stone:

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.

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.

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

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.

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: Rebecca Stone Organization: None

page 1 of 3

Preferred contact Method

Email: kauaibeck@gmail.com Postal Address:

Phone: (Optional)

Comments: Question: Will all comments/questions be published in Draft EID as we were told @ the Feb 19 Koloa meeting, or will "substantive written comments" be included? Who determines substantive criterion?
Question: Given the obvious audible hostility of citizens @ Koloa School, how can the proposed dairy be considered visionary? How can the possibility of ruining the Southshore be justified?
Question: Of the less than 1 square miles (640 acres) how many additional acres would be used for milking barn, storage, refrigeration, additional food, miscellaneous? What is the real acreage for the proposed cattle to graze? How many acres less than the available 578 will not be grazable?
Question: How can supplementally fed cattle be producing grass fed milk?
Question: Will pregnant cows be dried off for the recommended 2 months prior to calving? Will calves be separated immediately or allowed to suckle the recommended 30-90 days? These will be

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

Comments, Rebecca Stone page 2 of 3

the future milk cows and should receive the best possible nutrition.
Question: The ultimate in nutritional pasture is a variety of grasses. How does a grass like kikuyu which chokes out other companion grasses, allow for the optimal grass fed milk?
Question:
Recommendations for optimal re-growth of kikuyu grass is @ 30 Days, how does that reconcile with your proposed 18 day rotation schedule?
Question: Is the source of water sustainable when 50,000 Gal. or essentially 6,684 cubic feet, or the equivalent 3, 40 foot shipping containers is used daily.
Is the rainfall on the dry side of Haupu Ridge really adequate in rainfall to sustain cows' drinking water and irrigation?
Question:
How much water is required to irrigate 573 acres in a dry area?
Question:
Will the dairy cattle @ the proposed dairy have shade adequately?
Question: If the proposed dairy gets to functional operation, what will happen if odor complaints are registered?
Question: Will pesticides be sprayed on pasture?

Question: Not well; but WHICH hormones will be used if proposed dairy does become operational

Question: WHEN antibiotics are used, how will they be eliminated from any water source

Question: In this uncertain time of Climate change and Crisis, how will you plan to adjust or determine failure should a Dairy Disaster Arise? Diasaster would be rainfall change flooding or drought, contamination of stream, ocean, or any public water, wind change contaminating already existing food production or odors invading the air of any persons.

Question: What is back-up plan for proposed dairy to implement if refrigeration is interrupted or prolonged as in power failure, inclement weather, barge schedule delay?

Question: Since only 15-20 full time employees will work at the proposed dairy, has consideration been given to a possible on-site processing facility? This could augment local employment and actually create a Kauai Dairy - proposed, that is

In summary, I cannot support a dairy at the proposed site that ultimately threatens Kauai's South shore Beach Jewel.

Respectfully, Submitted Dr. Stern

GROUP 70 INTERNATIONAL

May 26, 2016

Rebecca Stone
3710 Kikee Road
Kalaheo, HI 96741
kauaibeck@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 Rebecca Stone:

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 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.

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.

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: Don Sullivan <yes_its_don@mac.com>
Sent: Sunday, February 08, 2015 1:48 PM
To: epo@doh.hawaii.gov; HDF
Cc: peters.gregm@gmail.com
Subject: Hawaii Dairy Farms Environmental Impact Statement

Follow Up Flag: Follow up
Flag Status: Flagged

Dear Environmental Planning Office,

In regards to the Hawaii Dairy Farms Environmental Impact Statement, I respectfully advocate for a thorough examination of waste management, air and water quality protection, herd growth triggers, cultural considerations, alternative actions (including alternative site selection), and binding mitigation measures.

In particular, I am concerned about Significance Criteria:
1. Involves an irrevocable commitment to loss or destruction of any natural or cultural resource; 2. Curtails the range of beneficial uses of the environment; and 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;

Thank You,
Don Sullivan
Felton, California

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
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Ma Ry Kim RIBA, ARB

OF COUNSEL

Ralph E. Portmore FAICP
Hitoshi Hida AIA

May 26, 2016

Don Sullivan
yes_its_don@mac.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 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.

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.

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

Feb. 21, 2015

James Sullivan
P.O. Box 798
Koloa, HI 96756
808 855 5558
jimsull@dakotacom.net

State of Hawaii, Department of Health; Group 70 International, Inc.;
Hawai'i Dairy Farms, LLC.

To Whom It may Concern:

I am writing to express my committed and vehement opposition to the proposed 2,000 cow industrial dairy farm in Maha'ulepu Valley on the island of Kauai. And to strongly urge that this project absolutely not be approved for its current siting, and if it is to be placed elsewhere on the Island, that it undergo this same rigorous approval process.

My name is James Sullivan, and I work at Poipu Kai Tennis Club and live between Koloa Town and Poipu, just off Poipu Rd. In my service position, so close to the proposed site, I have visitors tell me every week that if an industrial dairy is built in Maha'ulepu they will look into staying on the North Shore or other islands altogether. The damaging (perhaps devastating) economic impact has already begun. We must stop it.

In reading and rereading the Significant Criteria for the Environmental Impact Statement I was struck by how the proposed industrial dairy violates, or negatively affects all except fo one of the 13 Criteria. I won't attempt to go through all of them, however some are so negative, and perhaps irreversible, that I must touch on one or two of them.

The first and most urgent, most life-or-death, is water quality. By this I mean all forms of water, from the aquifers we drink and cook from, to the streams and watercourses of this traditional Hawaiian ahupua'a, the two wetlands in the area. and finally the ocean into which it all flows in this sacred area, the last wild bay on Kauai's South Shore.

We have all seen various staggering statistics on the amount of waste a herd of 2,000 cows will produce. the easiest way for me to visualize it is to realize that this would be, on average, the amount of waste (solid and liquid) generated by a human population of 328,800. That is FIVE TIMES the population of the entire island.

The clay soil that exists throughout most of the land will never be able to handle a wasteload that massive, and any projections by HDF that they will be able to manage that load without catastrophic effects on the Valley's fragile ecosystem are simply specious fantasies. The alarming readings of water quality in the stream and ocean of late are a crystal clear warning of future devastation. consider that a Koloa drinking water well is just 750 feet (not the one mile HDF claimed) from one of the proposed holding tanks and you have a disaster waiting to happen.

When (not if) we have our next major rain episode, the amount of nitrates and phosphates flowing into our sensitive lands and bodies will have devastating cosequences.

Lastly I will touch on Criteria #2, *Curtails the range of beneficial uses of the environment; (for plants, animals, or humans).* I honestly cannot think of a "beneficial use" activity, plant, animal *or* human, that will not be adversely affected by the addition of an industrial dairy in that valley. Swimming, snorkeling scuba, paddling fishing (pole, spear and thrownet), bicycling, and hiking are just a partial list of the human uses that will suffer greatly if this ill-designed project happens. Regarding "beneficial uses" by plant, animal and human communities, this is the worst idea I've heard proposed in all my years on this island.

All of these activities, of course, are engaged in by tens of thousands of South Shore visitors. these visitors providing millions of dollars in taxable revenue. We quite simply cannot afford to risk losing significant percentages of that revenue for a project which we provide precious few long-term jobs and which will be sending all of its product off-island to be sold who-knows-where.

And have I mentioned the flies? Tens or hundreds of thousands of swarming, biting flies sweeping throughout the South Shore resort district. The editors of *Conde Nast travel guides are going to love hearing that.* Please, do not let that happen. The keiki have to be able to visit this sacred area.

Sincerely,

James Sullivan

May 26, 2016

James Sullivan
P.O. Box 798
Koloa, HI 96756
jimsull@dakotacom.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 James Sullivan:

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.

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

February 23rd, 2015

Via Certified Mail, Return Receipt Requested

Laura McIntyre, Environmental Planning Office
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RECEIVED
FEB 24 2015
GROUP 70 INTL

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Hawaii Dairy Farms, LLC
PO Box 1690
Koloa, HI 96756-1690

Re: Concerns that need to be addressed Regarding the Proposed Hawaii Dairy Farm (HDF) in Mahaulepu, Kauai

Aloha Ms. McIntyre,

As a resident and business owner for the past 15 years on the South Shore of Kauai I can't help stress that an alternative location for the Dairy should be considered by Grove Farm and Hawaii Dairy Farms.

I am sure when you way the cost of potential economic damage to the tourism industry and potential job loss of the 1,500 employees who all work in the Poipu area versus the economic gain and employment of less than 20 at the Dairy Farm it is very apparent that the Dairy needs to find an alternative location.

I understand fully that the land is IAL and zoned agriculture however the development of the Poipu area has set the economic base as Resort. Majority of the job loss will come from the Grand Hyatt which many of the employees are also homeowners and have served the Hyatt for over 20 years. If these folks were to loose their jobs, there is no recovery for them and simply no other places of employment on the Kauai to serve 1,500 jobs. They will all loose their homes and health care. The Grand Hyatt will recover as they are a large corporation and just take a tax loss and move to another island but it's the families here on the Kauai that will loose. Many of the employees live from Kapaa to Kekaha and commute into Poipu for that said job.

I just think Hawaii Dairy Farms wants to be a valuable asset to the Kauai community and in that location , HDF will not be an Asset to Kauai. Tourism is driven by social media and the internet today and the thought of a Dairy smell so close to a World Class Resort area just isn't going to Fly with today's travel consumer.

Thank you for your consideration.

Yvonne Summerfield
Po Box 1394
Koloa, HI 96756
808-346-7251 ysummerfield@yahoo.com

May 26, 2016

Yvonne Summerfield
P.O. Box 1394
Koloa, HI 96756
ysummerfield@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 Yvonne Summerfield:

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.

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: Jay Sussman <yoyouto@gmail.com>
Sent: Monday, February 09, 2015 2:17 PM
To: HDF; epo@doh.hawaii.gov
Subject: Hawaii Dairy Farms EIS Comment

Follow Up Flag: Follow up
Flag Status: Flagged

To whom it may concern,

As a 37 year resident of Kauai I have seen many agricultural endeavors come and go. Some of these operations were "cleaner" than others on the environmental impact they had and left. Currently the water quality going into the ocean from the few animals that graze in Mahaulepu Valley is severely polluted. More animals will mean worse pollution because the soil does not absorb enough of the runoff. I feel that the dairy should be somewhere else on the Island where the runoff water containing the animal feces will not go into the ocean.

Jay Sussman
3024 Wawae rd
Kalaheo, HI 96741

GROUP 70 INTERNATIONAL

May 26, 2016

Jay Sussman
yoyouto@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 Jay Sussman:

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 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.

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

Ashley Swanson
1960 Nana Pali Rd
Lihue HI 96766

RECEIVED
FEB 2 6 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 and I have fond memories of days at Mahaulepu Beach with my family. You need to know Mahaluepu and its hiking trail are very special to many Kauai families. Dairy odor and flies will ruin Kauai families' hours spent at this beautiful beach and on the ocean side trail.

My mother passed away in 2012 which left our family devastated. Mom worked at the Grand Hyatt Kauai. My dad has worked in guest services at the Grand Hyatt for nineteen years. Dad has asthma. A dairy if located in Mahaulepu Valley will be directly upwind of the Grand Hyatt Kauai. The air pollution from a dairy of any size will cause respiratory harm to my dad. We can't afford to lose our surviving parent, emotionally or financially. How many other Hyatt employees will endure respiratory harm because they need their job to pay their mortgage? How many Hyatt guests will never return to Poipu?

The certain air pollution, flies, and economic harm to local Poipu workers caused by an industrial dairy in Mahaulepu valley all need to be addressed and answered by the EIS.

Sincerely,
Ashley
Swanson

May 26, 2016

Ashley Swanson
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 Ashley Swanson:

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

William Swanson
4413 Panui Street
Kalaheo HI 96741

RECEIVED
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,

I am a 55 year-old widower with three children and three grandchildren born on Kauai. My family has been swimming and surfing at Gillin Beach and Mahaulepu for 30 years. I have worked as a bellman at the Grand Hyatt Kauai for 19 years. The Hyatt is directly downwind of the proposed dairy. My son, my grandson and I suffer from asthma.

I've read about the air quality problems associated with dairy farms on the EPA's website. The air quality problems are caused by gases emitted from the decomposition of animal wastes and by the dust generated by animal activity and farming practices. These air pollutants can cause respiratory illness, lung inflammation and increase vulnerability to respiratory diseases like asthma.

Should my health and well being be affected by production of raw milk for shipment to Honolulu by a for-profit dairy development company called Hawaii Dairy Farms?

Will I have to quit my job to save my life because an air polluting dairy development is permitted to operate upwind of my work place? Will I get laid off because guests stop staying at the beautiful Hyatt because of the dairy's air pollution?

The certain air pollution and economic harm to Poipu visitor industry workers caused by an industrial dairy in Mahaluepu Valley need to be addressed and answered by the EIS. Specifically, a study must determine the distance aerosolized manure and urine will travel with Kauai trade winds when effluent is spread through overhead irrigation.

Aloha,

William Swanson

GROUP 70 INTERNATIONAL

May 26, 2016

William Swanson
4413 Panui Street
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 William Swanson:

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.

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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

-----Original Message-----
From: environmental.council
Sent: Wednesday, March 04, 2015 8:45 AM
To: mark.ambler@westonsolutions.com; mambler2002@yahoo.com
Cc: McIntyre, Laura; Wooley, Jessica E.; jessicaewooley@gmail.com; Hijirida, Linda M.
Subject: FW: KEEP HDF OUT OF MAHAULEPU

Mark,
Sorry, this was dated 2/19/15, but I didn't see it till now. Forwarding for your attention.

Laura,
FYI - this was addressed to the Environmental Council, so I don't think you have to respond to it.

Thanks,
Linda Hijirida

-----Original Message-----
From: Cynthia Talaber [mailto:ceejtal@gmail.com]
Sent: Thu 2/19/2015 7:22 AM
To: environmental.council
Cc: Dave Talaber
Subject: KEEP HDF OUT OF MAHAULEPU

Members of the Environmental Council:
Not enough time was given to allow me to mail this, so this email counts as a mail-in.
Please do not allow Hawaii Dairy Farms to ruin our Mahaulepu. Haven't you considered the economic disaster that will happen? All because a billionaire needs a tax writeoff?
When HDF plans to create a large "zero discharge" dairy for the first time in Hawaii, why locate an experiment like this in a beautiful, treasured place, which has deep roots in Hawaiian culture, and has a fragile environment and ecosystem?
Why does HDF insist on calling its dairy "grass fed" when their management plan calls for supplementing each cow's feed with at least 26 pounds of grain daily (HDF plan, page 90)?
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 Mahaulepu, as more than 50 percent of the proposed farm soil is at high or very high risk of runoff due to its high clay content. Instead, HDF has never retracted their printed claim of "NRCS permit-completed." As anyone can verify, the NRCS does not issue permits for any operation in Hawaii.
HDF states that it "independently modified" the design of the effluent ponds after having "received additional rainfall data" and as a result of a "collaborative effort with community members and the DOH," but he neglects to mention that HDF submitted their initial plan for the ponds without adequate soil analysis and without accurate storm event and

rainfall readings. Why didn't HDF check with Grove Farm (their landlord), who has recorded and reported to the state all rainfall readings from the Mahaulepu rain gauge for the past 50 years? Grove Farm sends its readings to the state hydrologist and National Oceanic and Atmospheric Administration, from whom Datta claims HDF eventually got their information. With a simple phone call to NOAA, FOM obtained rainfall/storm event records the same day. Those records were then shared with Sina Pruder at DOH. Subsequently, Ms. Pruder informed FOM that HDF had been asked to increase the size of their effluent ponds. In the event of a storm, or extended rainfall event (remember 30-plus days in 2006?), a serious risk of overflow/discharge exists with ponds already full of effluent and manure residue.
Speaking of being informed, as early as 2003 the American Public Health Association called for a nationwide moratorium on large animal operations such as the dairy proposed for Mahaulepu - citing overwhelming scientific evidence of public health concerns. Their call was repeated by the Canadian Medical Association, the Michigan State Medical Society and numerous local boards of health across the land.
Kauai has a cherished history of small, sustainable businesses. It should be no different with agriculture. Sustainable, environmentally sound, akamai - these are the hallmarks to which we aspire, whether it be in energy, tourism, development or ag. FOM members have donated their time, training and expertise to study HDF's proposal and looks forward to a complete and honest evaluation of Mahaulepu as a suitable location for the proposed industrial dairy.
We are simply asking that a much smaller sustainable dairy be located elsewhere on land that cannot be easily contaminated, is not culturally significant, is away from drinking water, population centers, our vibrant visitor industry, and won't damage the beauty and tranquility of our local landscape.
Cynthia and Dave Talaber
1871 Pee Rd
Koloa, HI 96756

May 26, 2016

Cynthia & Dave Talaber
ceejtal@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 Cynthia & Dave Talaber:

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.

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 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

From: Ken Taylor
To: Hawaii State Department og Health; HDF
Subject: Hawaii Dairy Farm Comments
Date: Sunday, February 22, 2015 5:44:01 PM
Attachments: Ken Taylor.pdf

From: Ken Taylor

Laura McIntyre 2/22/15
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

RE: COMMENTS ON HAWAI'I DAIRY FARM'S ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE, DATED JANUARY, 2015.

Dear Ms. McIntyre,

The EIS must look at:

A) The entire Project must be Described, Including Reasonably Foreseeable Activities.

Normally Significant Impacts:

A) Substantially increase traffic or ambient noise.
B) Impacts which are cumulatively considerable, when viewed in conjunction with the effects of other past, present and probable future projects. The projects contribution must be significant, but need not itself constitute a substantial percentage of the entire cumulative impact.

Project Alternatives:

A) Must discuss both mitigations and alternatives to the proposed project.
B) Each alternative must be described in sufficient detail to permit comparison with the proposed project.
C) The EIS must focus on alternatives, capable of "substantially lessening" adverse environmental and cultural effects.
D) The "No Project" alternative must always be considered.

Kikuyu Grass

A) Kikuyu grass is an invasive species. Kikuyu grass dose go to seed. In Hawaii we are spending millions of dollars each year to eliminate invasive species, why would we let someone introduce to Hawaii, Kauai an invasive species? Please get a full report from Kauai Invasive Species Committee. Bill Lucey Project Manager at KISCmgr@hawaii.edu. Also if the project goes forward require the project to be responsible for any eradication needed, Island wide.

Water

A) A thorough study must be done on groundwater and surface water contamination resulting from this project that would have substantial affect on public health and the environment..
B) The proposed project has the potential to degrade the quality of the environment, curtail the range of the environment, to the disadvantage of long-term environmental goads.
C) The environmental effects of the project will cause substantial adverse effects on humans beings, either directly or indirectly.

Health and safety

A) If cows are milked twice a day and there Is no please on Island for processing, how will the milk be dealt with while weighting shipment to Oahu.

Significant Impacts on Important Cultural and Historic Sites

A) The proposed Dairy would significantly Impact important Cultural and historic resources on this site. If the dairy would go forward they will experience sick and dying cows, sour milk or no milk, or milk not suitable for drinking. If this was to happen how would each of these issues be dealt with?

Economic and Social

A) Require a socioeconomic Impact analysis.
B) Economic or social effects of the project must be used to determine the significance of physical changes caused by the project. (Changes such a smell.)

Mitigation includes

A) Avoiding the impact altogether by not taking a certain action or part of an action.
B) Minimizing impacts by limiting the degree or magnitude of the action and its implementation.

Some Thoughts

We have an economy that tells us that it is cheaper to destroy earth in real time rather than renew, restore, and sustain it. You can print money to bail out a bank but you can't print life to bail out a planet. At present we are stealing the future, selling it in the present, and calling it gross domestic product. We can just as easily have an economy that is based on healing the future instead of stealing it. We can either create assets for the future or take the assets of the future. One is called restoration and the other exploitation. And whenever we exploit the earth we exploit people and cause untold suffering. Working for the earth is not a way to get rich; it is a way to be rich.
Paul Hawken

Ken Taylor
taylork021@ hawaii.rr.com
two pages

May 26, 2016

Ken Taylor
taylork021@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 Ken Taylor:

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.

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.

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.

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

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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: res1u91o@verizon.net
Sent: Monday, February 09, 2015 3:37 PM
To: HDF
Cc: epo@doh.hawaii.gov
Subject: publication of the EISPN on Jan. 23 - Hawaii Dairy Farms

Follow Up Flag: Follow up
Flag Status: Flagged

As a land owner on Kauai, I think a dairy farm with 250 cows is more than adequate. A dairy farm with 2000+ cows is irresponsible, greedy. and self destructive for the whole island. Kauia is called the Garden Island for a reason, lets not ruin that reputation and turn the south shore into a dairy wasteland.

Terry Taylor
Poipu Beach

GROUP 70
INTERNATIONAL

May 26, 2016

Terry Taylor
res1u91o@verizon.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 Terry Taylor:

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.

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.

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.

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

RECEIVED
FEB 27 2015
GROUP 70 INTL

Group 70 International, Inc.
925 Bethel St. 5th floor
Honolulu, HI 96813
re: Hawaii Dairy Farms

I am a resident of Kauai and an interested party in the proposed HDF project at Maha'ulepu. I do have grave concerns about the dairy for the following reasons:

1. Maha'ulepu is an extraordinary place, worthy of being kept as is. I have always recommended it to tourists and visiting friends as the premier attraction on Kauai because of its natural, unspoiled beauty. To a person, they have concurred that it is unique and worth preservation. A dairy farm with hundreds, indeed, two thousand cows will result in irreparable change/damage to the area. There can be no doubt that animals, like man, affect their environment negatively. How will the EIS address this issue?
2. An industrial dairy farm would be extremely detrimental to the marine life because of run-offs from the dairy to the ocean. Nature cannot be controlled and its effects, mitigated. How can the vagaries of weather be addressed?
3. I am concerned about the health hazards that currently exist on the site. It has been publicly acknowledged that the bacterial counts of Waiopili Stream are already considerably above safe limits. The stream should be cleaned up before HDF commences any activity. The EIS must address this issue.
4. I am worried about the proximity of the animals to the wells that provide drinking water to local residents. What will occur should the water become contaminated and people become ill?
5. Although I do not have personal experience with odors and flies near dairies, I have reason to believe that residing within two miles downwind of the dairy, I will be affected. Both my brother who is a waste management specialist with the State of California and a former neighbor who arranged financing for dairy farms confirmed that the odors and numbers of flies will be substantial. What are plans for mitigation?

Finally, I sincerely hope that Group 70 International will be relying on reports and studies from SEVERAL sources for each criterion as they prepare the EIS. ONE or even two or three scientific or professional opinions are not adequate or conclusive. I have heard rumors that Group 70 has previously done work on the HDF project or for Ulupono. Is this true? Please answer by email: tuzi@earthlink.net

Thank you,
Tayemi Susan Thompson

2237 Iukika Pl.
Koloa, HI 96756

May 26, 2016

Tayemi Susan Thompson
2237 Iukika 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 Tayemi Susan Thompson:

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.

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.

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: Anne Thurston <athurston@irmt.org>
Sent: Thursday, February 19, 2015 7:55 PM
To: epo@doh.hawaii.gov
Cc: HDF
Subject: Daft EIS for proposed dairy project at Maha'lepu

Thank you for giving us a chance to comment on the EIS for proposed industrial diary at Maha'lepu. As you know, there has been considerable public concern about this project, which does not appear to have significant benefits for the needs of our community but which we feel brings very high risks. In the 15 years that I have lived on Kaua'I, I have had regular contact with outstanding biologists and environmentalists across the island, all of whom share deep and genuine concerns about the impact of this proposed dairy operation. We hope that there will now be a thorough examination of such fundamental issues as waste management, air and water protection, herd growth triggers, cultural impacts, alternative actions and alternative site selections, and binding mitigation measures. It is our expectation that the draft EIS will at least cover potential impacts on public health, cultural heritage, ecosystems, and natural resources.

In particular, we feel that it there needs to be close consideration of the impact on Hawaiian culture, since the entire area is a spiritual sanctuary. We have an obligation to respect the Hawaiian cultural sites that are are located within or adjacent to the proposed dairy lands. It will be important to take care to honor the many unmarked sites and burial grounds, for, as you are undoubtedly aware, Hawaiians did not label gravesites. We want to see a careful study of the exact locations of these sites, and we want to see a thorough cultural resources study, with clear proposed measures to protect these sources. We also want to see evidence that traditional cultural practices, such as fishing and hunting are being protected.

We are also particularly concerned about potential water quality contamination, and we would like to be reassured by clear evidence that no nutrient of effluent run will occur. We consider this to be a very high risk for drinking wanter and public health in the region of Koloa and Poipu. We have a related concern that air quality monitoring has not been included in HDF's proposed management plans. There must be testing done to ensure that effluent smell will not drift into Poipu/Koloa.

We expect the EIS to address the need for environmental indicators to determine whether the land and natural resources can support phase increases in herd size, and we expect that the EIS will include an integrated pest management plan for fly control with intended biological, mechanical and potential pesticide 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 and monitoring regimes with guaranteed community involvement are examples of mitigative measures that could be binding. We also believe that the EIS must include plans for site remediation for when the lease ends or 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 there be a remediation fund to cover the cost of returning the site to its natural state?

The EIS needs to take into consideration other reasonable locations both on Kauai elsewhere in Hawaii that meet HDF's acreage and water access requirements without the high risks involved on this site. We feel that the list of alternatives provided in Hawaii Dairy Farms EIS preparation notice are far too limited. We feel that other alternatives should be suggested and thoroughly examined, including alternate agriculture uses.

Thank you for your attention to these concern.

Yours sincerely,

Anne Thurston
3639 Keoniana Road
Princeville 96722

GROUP 70
INTERNATIONAL

May 26, 2016

Anne Thurston
athurston@irmt.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 Anne Thurston:

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.

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-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.

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: Karen
To: HDF
Subject: My public comments regarding Hawaii Dairy Farm EIS
Date: Monday, February 23, 2015 2:25:16 PM
Attachments: dairy letter.pdf

Please print out and read.

thank you.

Karen Tilley

HDF@Group70int.com

Karen Tilley
P.O box 510021
Kealia Hi
96751

Dear Sir or Madam,

I feel strongly that serious and irreparable harm will result if the industrial dairy proposed for Maha'ulepu is not relocated to another area.
I will focus on one comment but I ask that the many issues and questions presented by Bridget of Friends of Mahaulepu need to be addressed.

The clay soil will not be able to deal with the millions upon millions of feces and urine and it will only be a matter of time that the feces enters the ocean, rivers and --- into the well water. Thus, this is an idiotic, absurd, plan.

I am aghast that a Voluntary "EIS" is being done - by you... by the people who are working for the billion dollar company. That in its own is a travesty...

Human lives are at stake here - and so much more.
This is an environmental catastrophe in the making --- There are plenty of examples like the New Zealand Experience and Walkertown Ontario water contamination. DO NOT PROCEED TO KILL AND INJURE THE PEOPLE AND OTHER LIFE HERE ON KAUAI by allowing the extremely high likelihood of water drinking water contamination to happen.

Karen Tilley

GROUP 70
INTERNATIONAL

May 26, 2016

Karen Tilley
P.O Box 510021
Kealia, HI 96751
forkarentilley@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 Karen Tilley:

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.

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: Max Trapp
To: HDF
Cc: epo@doh.hawaii.gov
Subject: NO for the Dairy Farm
Date: Monday, February 23, 2015 3:00:25 PM

To Whom it may concern,

I am writing to express my extreme concern and opposition with regard to the proposed Dairy Farm project.

As a Kauai resident and a Real Estate Broker with Century 21 All Islands, I think the project is a potential disaster with very negative effects on the Tourist industry, not to mention the local population, of the Poipu area. I will not waste your time with restating the numerous objections that have been presented, they stand on their own.

Get your heads out of your self-interest pocketbooks and realize that this would be a horrible use of the 578 pristine acres in Mahaulepu and would create an environmental nightmare!

Please see the reality, thank you,

Max Trapp
Realtor, Broker
Century 21 All Islands
Kapaa, HI 96746
808-652-5796
Max@ReachTheBeach.com

GROUP 70 INTERNATIONAL

May 26, 2016

Max Trapp
Kapaa, HI 96746
Max@ReachTheBeach.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 Max Trapp:

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

From: Sheri Trentlage <STrentlage@davidchapmanagency.com>
Sent: Saturday, February 21, 2015 9:22 AM
To: epo@doh.hawaii.gov
Cc: HDF
Subject: Dairy Farm...

Aloha;

We live in Poipu and would like to express our concerns about the proposed dairy.

We have participated in the various meetings and read the articles in the Garden Island news about the plans.
We do not feel there are enough benefits for the island or people of Kaua'i to offset the potential damage to a historical, spiritual, and treasured site.

Why take the risk when there are so many other places to put a dairy?
Why select a place that is sacred and pristinely beautiful and pollute it?
Hawaii has had enough cultural abuse in it's past. It's time to stop.

Dave & Sheri Trentlage
1661 Pe'e Road, #1302
Koloa HI 96756

GROUP 70 INTERNATIONAL

May 26, 2016

Sheri & Dave Trentlage
1661 Pe'e Road #1302
Koloa, HI 96756
STrentlage@davidchapmanagency.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 Sheri & Dave Trentlage:

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.

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.

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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 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

2/21/15

RECEIVED
FEB 24 2015
GROUP 70 INTL

Group 70 International, Inc.
Attn: HDF Project
925 Bethel Street, 5th Floor
Honolulu, HI 96813

Dear Sirs,

My family and I live in Koloa on the bypass road and are very concerned about the health risks a dairy three miles up wind poses as I have respiratory issues with vog and pollen and for a while when Grove Farm had Pioneer chemical test fields right across the road we were all chronically sick. I want to know how you can possibly contain the allergins and smell of a dairy farm where all others have failed?

Our home is our life investment. If you dairy pollutes the air and water our investment will be compromised along with all of our neighbors who have worked very hard to live here and own a home.Staitsicly dairies devalue homes in the area. What are you going to do for the residents that can sell for their pre-daiy price when the stench of your business kills the market?

What will you do about the loss in revenue to the visitor industry on the South shore for which my wife, myself and her aprents and most of our friends are dependent if visitors don't like the smell of a dairy when they come out of their expensive accomodations?

I do not like the fact the EIS is only for the initial 500 cows not the toal herd you are planning on. I do not like the fact you are telling the public you are volunteering to do an EIS, as from what I know high density animals in a dairy are definitantly a pollutant and you do not have a choice. Why are you bent on having your dairy in Mahalepu near a residential and one of the major resort areas on the island when there is so much vacant land up-country?

Why are you putting holding tanks for all the contaminants (cow crap) right next to our wells? ONe is only 700 feet away. That does not sound responsible let alone intelligent.

The Hyatt is the island biggest employer. Your dairy will be one of the smallest employers - why would you do something to compromise their business which so many people are dependent on directly or indirectly?

What are you going to do with the calves born to each cow each year? Are they part of your 2,000 head dairy? If you don't keep them what do you do with them especially the males and will it be humane? What about the bulls? Are the bulls part of the 2,000 head count?

Are you aware that the water out there is already conatminated as the clay soil cannot handle what cattle are presently grazing in that valley, let along the horse stable, wild pigs, and human waste dump?

Do flash floods concern you at all, especailly when they last 40 days and nights like they do sometimes? How will you handle clean up of our beaches if test showou have further erroded their cleanliness and that nitrates are killing the reefs?
Why did you lie about Dr.Chin Li at UH who never advised you about grass type, or planting. I can't help but wonder who else has been mis-quoted among your experts.

Your New Zealand model sounds like a disaster to everyone else who has talked about it but you r team. Why are you still using that as a selling point?

I dont feel like any assurances for a the super fund clean up is going to be there to protect our investments as residents. The risk is to high for our fragile coastal areas for a rich man to experiment with an ocean front (practiacally) dairy farm at the residents of Kauai's expense.

So far from what I have heard at your meetings where nothing gets answered and we just hear a bunch of promises with no back up or science. Anyone who has lived on a dairy or near one even a 1/10 of the size of what you are proposing know it is a bunch of bull when you tell us it won't stink and there won't be any flies.

Mahalo

Luis Trevino
2551 Ala Kinoiki
Koloa, HI 96756

808-652-1664

cc: Hawaii State Dept. of Health, Environmental Planning Office
cc: Hawaii Dairy Farms, LLC
cc: Group 70 International, Inc

GROUP 70 INTERNATIONAL

May 26, 2016

Luis Trevino
2551 Ala Kinoiki
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 Luis Trevino:

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 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.

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

Group 70 International, Inc.
925 Bethel Street, 5th floor,
Honolulu, HI 96813

RECEIVED
FEB 17 2015
GROUP 70 INTL

February 9, 2015

Dear Gentleman or Lady,

Subject: How the Hawaii Dairy Farm (HDF) "Substantially affects the economic or social welfare of the community or State"

We are writing you today to lodge an objection to the Hawaii Dairy Farms approval to establish a large Dairy farm in the Kauai South Shore and Maha'ulepu Beach area. Since this Po'ipu Beach area (sometimes referred to as the 'Waikiki' of Kauai) and its surrounds have been designated 'A Kauai Visitor Zone' it has an economic impact on Kauai and Hawaii of immense importance.

We live 2 miles southwest of the intended location, directly downwind of the prevalent trade winds and in the middle of Poipu Beach. This area will no doubt be affected by the odor and insects generated by the 2000+ cows as our new neighbors. What will be even more detrimental is when those odors and flies are documented on the many WEB sites that are visited by future potential tourists to our island.

Please take the economic impact into consideration as well as the well documented potential environmental and social impacts when you decide if this project deserves to go forward.

George Valentini and Pam Littlefield
1870 Ho'one Road
Po'ipu Beach, Hi

George Valentine

GROUP 70 INTERNATIONAL

May 26, 2016

George Valentini and Pam Littlefield
520 Country Lane
Glenview, IL 60025

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 Valentini and Pam Littlefield:

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.

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: 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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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 15, 2015

Group 70 International
925 Bethel Street
5th Floor
Honolulu, HI 96813

To whom it may concern:

My name is Beth Valenziano. My husband and I have owned a Condo in Poipu, Kauai since 1998. I am writing to you in order to express my deep concern for the Hawaii Dairy Farm which is under consideration for operation in the Maha'ulepu Valley. Based on information that I have reviewed from various sources, I have come to the conclusion that this operation will pose huge environmental and economic risks.

If this dairy farm operates at the full proposed capacity, the manure produced by these cows will amount to 8.5 million pounds per month. It is difficult to imagine how this waste will be managed given the type of soil and the location of this facility. The proximity of the facility to fresh water supplies is also alarming when considering the potential contamination that could take place. HDF promotes itself as a sustainable farming facility. The true definition of sustainable farming is not only to provide local sourced food but also to have no long term negative impact on the environment. It is difficult to imagine how this amount of waste will be managed without any negative effect on air and water quality.

I would also like you to please take into consideration the potential negative economic impact this facility could have. Property tax revenues in Poipu amount to close to 26 million dollars per year. This is almost 25% of the property tax revenues generated on the entire island. The potential for reduced property values seems inevitable considering the effect other large scale dairy operations have had on property values in other parts of the country. I do not see how it is possible that the HDF could be considered a positive factor from a property value perspective. It is difficult to imagine how this lost revenue will be recouped.

Lost property taxes will not be the only unintended consequences of this operation. The domino effect of reduced occupancy at the Hyatt and other resort properties will prove devastating for local residents and small businesses on the South Shore who rely on the constant influx of tourists to the South Shore. It is difficult to imagine anyone wanting to spend the minimum $500 per night at the Hyatt only to wake up to the smell of cow manure. Please consider the fact that the Hyatt is the largest employer on the South Shore. Jobs at the Hyatt offer benefits that most small employers on the island cannot offer. Is the potential job loss at the Hyatt worth the 14 jobs that will be gained from operations at the Dairy Farm? Hawaii is one of the most expensive places to live in the country. I can't imagine the stress that potential job losses and reduced economic activity will have on the local community.

As I mentioned, I am a property owner on the South Shore of Kauai and I therefore have an obvious economic interest. I am also an environmentalist who is saddened by the potential damage the HDF will have on Maha'ulepu Valley, its indigenous wildlife and the local population. Please also consider the contamination that will certainly occur on other local beaches such as Poipu Beach which is frequently voted one of the top beaches in the country. I can only imagine the effect of elevated E.coli counts on tourism. When I am on the island, I walk to Maha'ulepu everyday and marvel at its pristine beauty as do most people who have had the opportunity to be lucky enough to experience such a special place. I hope you will recognize the importance of Maha'ulepu from an environmental, economic and cultural perspective and not allow the HDF to operate in such an important and significant place.

Mahalo for your consideration,

Beth Valenziano

Beth Valenziano

GROUP 70 INTERNATIONAL

May 26, 2016

Beth Valenziano
520 Country Lane
Glenview, IL 60025

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 Beth Valenziano:

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 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 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: Robert Vlach <bobvlach@gmail.com>
Sent: Wednesday, February 18, 2015 8:11 PM
To: HDF
Subject: Maha'ulepu Valley and Coastline Concerns

HDF

Dear Sir;

My name is Robert Vlach. I currently live in Ashland, Oregon. I physically am not a resident of Kauai, however my heart is a full time resident. Please allow me to explain.

My wife, Sherita, and I were married on Maha'ulepu Beach in 2004. This spot was a great favorite of hers. Just about five years later she contracted Pancreatic cancer and passed on from this life. In her memory we held a family memorial on our spot in August of 2009. I and the family have returned to Hawaii many times in the past few years. In April of this past year my son, Michael, and I finished installing a labyrinth in her honor. In the past year we have received many comments from visitors all over the world when passing by the site, indicating the attraction of this pristine stretch of beach to a wide assortment of hikers and naturalists.. We only used native rocks and plants to complete the project so as to not disturb the beauty of this area which has a long history of value both by the Kama'aina and tourist alike.

As we were laboring on the site we were informed of the proposal for a large Dairy operation in the Maha'ulepu Valley. At first I was not so concerned as it seemed a small "local" venture would be an addition to the economy. However as more information comes to light I am having great angst and concern over this proposal.

In the first place the frail limestone soil composition of the coast, and the coral seem to be susceptible to damage from the runoff from this operation. The proposal appears to be way too large for the Aina to accommodate such an influx of waste matter as well as taxing the already stressed domestic water supply.

In the second place the smell of such an operation would definitely adversely effect the tourist industry on the South shore. I spent much of my early years in California near Stockton and Manteca and the smell of their stockyards is intense. No one is going to spend $300 to $800 a day at the Hyatt with this type of pollutant present..

Lastly this area is one of great historical, archaeological, and bio-diversity interest and with no less than two Heiau sites must be preserved from damage.

I know that many have already brought up concerns on this subject. And I know they have a much more professionally developed study on the issue. I just urge from a personal viewpoint that this proposal be closely looked at before allowing this large an operation on such a small and sensitive section of an island I love dearly.

Mahalo Nue Loa for reading this appeal. Bob Vlach "Lopaka"

May 26, 2016

Robert Vlach
bobvlach@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 Robert Vlach:

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.

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

FEB 25 2015

22 February 2015

State of Hawaii – Dept. of Health
Environmental Planning Office
919 Ala Moana Blvd, Room 312
Honolulu HI 96814

Attn: Ms. Laura McIntyre

Re: Hawaii Dairy Farms Proposal

Dear. Ms. McIntyre:

I come to Kauai every year and recently became aware of the proposed dairy farm in Maha'ulepu Valley. Working in the environmental consulting business and having read the EISPN, it concerns me that the study is overlooking a key issue. And that is how storm run-off can carry waste in either solid or dissolved form to streams that in turn drain into the ocean. There is no surface water hydrology component noted in Section 4.5 identifying the individual technical studies. I note there is a groundwater hydrology element, but the resume of that subject matter expert (Tom Nance) covers only injection or water supply wells focusing strictly on groundwater. Why couldn't the responsibilities of ARCADIS be expanded to include storm water flow and surface water interaction, since I know that company has such expertise? I think the EIS needs to address and answer this question.

Regards,

Diane Walden

Diane Walden
65 Hastings Lane
Chagrin Falls OH 44022

GROUP 70 INTERNATIONAL

May 26, 2016

Diane Walden
65 Hastings Lane
Chagrin Falls, OH 44022

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 Walden:

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:

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.

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 – Dept. of Health
Laura McIntyre, Environmental Planning Office
919 Ala Moana Blvd, Room 312
Honolulu HI 96814

Re: Hawaii Dairy Farms Proposal

Dear. Ms. McIntyre:

As an annual visitor to Kauai, Poipu area and an environmental engineer, I have a few questions regarding the proposed dairy farm that I would like the EIS to address:

1. It is a misnomer to classify this farm as a 'zero discharge' facility. 'Zero discharge' means any contaminated water is containerized and hauled away to a treatment facility. What actually is occurring is that water exceeding the nitrate drinking water standard of 10 mg/l will be land-applied and allowed to percolate to the groundwater or run-off to surface streams. The credibility and transparency of the project is immediately called into question over the issue of semantics in a similar way that the EISPN refers to rental units as being 'vacant'.

2. There is no mention in the EISPN of an air dispersion model. The volatile emissions from the 'nutrient'-fed grazing area must be modeled by ARCADIS to predict odor exposure to the residents/visitors in the Poipu/Koloa area.

3. The EISPN also is not specific on groundwater/surface water interaction, especially in regards to modeling migration of nitrate or bacteria that could pose a human health risk. A site conceptual model must be developed to predict the fate and transport of these contaminants within different stratigraphic units, and quantify the threat posed to potable water wells and surface water quality.

4. Finally, from a 10,000 ft. view, it seems very odd that only the 3rd dairy farm on all the Hawaiian Islands would be sited so close to a major economic hub with all the attendant risks associated with human health, aesthetic impact and property diminution claims. With so much other rural land available on Kauai, why would the State or developers want to subject themselves to such a high level of scrutiny and legal challenges when all of this can be readily avoided?

Regards,

Terry Walden
65 Hastings Lane
Chagrin Falls OH 44022

May 26, 2016

Terry Walden
65 Hastings Lane
Chagrin Falls, OH 44022

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 Terry Walden:

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).
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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
To: HDF
Subject: FW: comments on Hawaii Dairy project Kauai
Date: Monday, February 23, 2015 10:39:51 AM

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fyi

-----Original Message-----
From: Mark Waldrop [mailto:marklwaldrop@yahoo.com]
Sent: Sunday, February 22, 2015 3:57 AM
To: EPO
Subject: comments on Hawaii Dairy project Kauai

Aloha, please add this email to the comments on the Hawaii Dairy project planned for the Mahaulepu area on Kauai. I read a letter in the Garden Island newspaper that expresses my thoughts exactly. I am copying it here in the body of this email because it is so well written and states what I know to be true as well. My wife and I are property owners in the Poipu area and oppose this dairy project going forward because of the harm it will do to the environment as well as to the property values and quality of life . Mahalo.

Mark Waldrop
2721 Poipu Rd #321
Koloa, HI 96756

My husband and I own a small condo in the Poipu area and we will be retiring to the beautiful island of Kauai within the next 3 years. We were so shocked to hear that there is a possibility of an industrial dairy farm being constructed on Mahaulepu with a herd of up to 2,000 cows. My first thought was "What are they thinking?" and "I must have heard this wrong." With all the strict regulations that the county government has for building height, street light wattage, swimming pool construction, protection of the wildlife, etc., I never thought that something like this would be a possibility. We chose Kauai as a place to retire because Kauai, of all the Hawaiian Islands, seemed to have their act together when it came to the preservation of true Hawaii. WHAT HAPPENED?

My mother was raised in a dairy farming family. My grandparents were dairy farmers and a number of generations before them were as well. They all used "sustainable" and "grass-fed" farming practices. My cousins continued the family dairy farming up until just recently.

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 winter feed 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 Mahaulepu. They plan to start production with 699 cows and then move to 2,000 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.

While 500 acres sounds like a lot of land to graze 699-2,000 cows on, basically it means that during the start-up phase, seven cows would be grazing and defecating on 10,000 square feet of "pasture," the size of a standard house lot. At full production 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 house on a 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.

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 interval but the manure will still be wet and likely contribute to hoof rot when trampled by the returning herd.

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 three 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?

What about the chemicals that will be used to clean the cows and the milking structure? I know they use iodine to wash cow udders. When that gets into the run-off, who or what does that harm?

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 they be harmed from the run-off? Will the humpback whales stop swimming by?

I have only touched on a few concerns if this project were allowed to go forward. Everyone needs to push to stop this and keep the Poipu area pristine and ensure an ongoing economy in tourism. If this industrial dairy farm is allowed to pass it will probably be the cause of many health issues (especially for children), wildlife loss from the run-off and the loss of many jobs in the tourist industry. The tourists will not come to visit due to the overwhelming smell and fly problem.

There are many more concerns if this project is allowed to move forward. I feel it should be everyone's responsibility to stop this project. We need to keep the children healthy, save the wildlife's habitat and preserve the Poipu area as a thriving tourist destination.

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Beverley Ellul is a resident of San Jose, California.

~~AW~~ aw GC
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Alec Wong

Department of Health-Clean Water Branch

P.O. Box 3378

Honolulu, HI 96801-3378

March 23, 2015

Mark L. Waldrop

2721 Poipu Rd #321

Koloa, HI 96756

Dear Mr. Wong,

My wife and I own a home in Koloa on the island of Kauai and am writing you concerning the Hawaii Dairy project planned for the Maha'ulepu area on Kauai. I read a letter in the Garden Island newspaper that expresses my thoughts exactly. I am copying it here in the body of this letter because it is so well written and states what I know to be true as well. I oppose this dairy project going forward because of the harm it will do to the environment as well as to the property values and quality of life . Mahalo.

"My husband and I own a small condo in the Poipu area and we will be retiring to the beautiful island of Kauai within the next 3 years. We were so shocked to hear that there is a possibility of an industrial dairy farm being constructed on Mahaulepu with a herd of up to 2,000 cows. My first thought was "What are they thinking?" and "I must have heard this wrong." With all the strict regulations that the county government has for building height, street light wattage, swimming pool construction, protection of the wildlife, etc., I never thought that something like this would be a possibility. We chose Kauai as a place to retire because Kauai, of all the Hawaiian Islands, seemed to have their act together when it came to the preservation of true Hawaii. WHAT HAPPENED?

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•••

Beverley Ellul is a resident of San Jose, California."

Mark Waldrop
2721 Poipu Rd #321
Koloa, HI 96756

GROUP 70 INTERNATIONAL

May 26, 2016

Mark Waldrop
2721 Poipu Rd #321
Koloa, HI 96756
marklwaldrop@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 Mark Waldrop:

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 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.

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).
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- 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.

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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: Thursday, February 12, 2015 8:44 AM
To: Mary Waldrop; EPO
Cc: HDF
Subject: RE: comment on Hawaii Dairy Farms project

Follow Up Flag: Follow up
Flag Status: Flagged

Aloha Mr. and Mrs. Waldrop,
Thank you for your comments.
This email confirms receipt of your comments regarding the Hawaii Dairy Farms project and the forwarding of those comments to the consultants preparing the Draft EIS. 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: Mary Waldrop [mailto:marygwaldrop@yahoo.com]
Sent: Wednesday, February 11, 2015 7:01 AM
To: EPO
Subject: comment on Hawaii Dairy Farms project

Aloha, My husband and I are property owners in the Poipu area. We also lived in Roswell, NM for 25 years. We have experience living near newly constructed dairies. The Roswell area had a growth spurt of people from the Chino Valley area in California moving in to open dairies. The diaries ranged in distance from @ 12-30 miles from the north part of Roswell. We could smell the cows from the dairies and their waste even at that distance from us. We realize Hawaii Dairy Farms is "promising" there will be no adverse environmental effect to the Poipu area or Mahaleapu . We do not believe that is possible. The soil is not the proper soil content to be able to handle the waste produced from 699 to 2000 cows. The drainage into the ocean will adversely effect the beaches and pristine conditions of the Mahaleapu and Poipu areas. The smell and the flies will reach to the Poipu area and adversely effect the living conditions and property values. The idea of introducing to the Kauai environment other living insects to combat the flies is ludicrous. We wholeheartedly oppose this dairy being constructed in the Mahaleapu area. Please do not allow the dairy construction to go forth at this particular location. We know from personal experience what are the true effects of having dairies closeby. The economic value in no way balances the devastating environment and quality of life consequences. Thank you for considering our comments.
Mark and Mary Waldrop
2721 Poipu Rd. #321
Koloa, HI 96756

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SCANNED
3.30.15

2015 MAR 30 8:28AM

Alec Wong

Department of Health- Clean Water Branch

P.O. Box 3378

Honolulu, HI 96801-3378

March 23, 2015

Mary G Waldrop

2721 Poipu Rd #321

Koloa, HI 96756

Dear Mr. Wong,

My husband and I are home owners in the Poipu area on Kauai. We also lived in Roswell, NM for 25 years. We have experience living near newly constructed dairies. The Roswell area had a growth spurt of people from the Chino Valley area in California moving in to open dairies. The dairies ranged in distance from @ 12-30 miles from the north part of Roswell. We could smell the cows from the dairies and their waste even at that distance from us. We realize Hawaii Dairy Farms is "promising" there will be no adverse environmental effect to the Poipu area or Maha'ulepu of Kauai. We do not believe that is possible. The soil is not the proper soil content to be able to handle the waste produced from 699 to 2000 cows. The drainage into the ocean will adversely effect the beaches and pristine conditions of the Maha'ulepu and Poipu areas. The smell and the flies will reach to the Poipu area and adversely effect the living conditions and property values. The idea of introducing to the Kauai environment other living insects to combat the flies is ludicrous. We wholeheartedly oppose this dairy being constructed in the Maha'ulepu area. Please do not allow the dairy construction to go forth at this particular location. We know from personal experience what are the true effects of having a dairy closeby. The economic value in no way balances the devastating environment and quality of life consequences. Thank you for considering our comments.

Mary G. Waldrop

2721 Poipu Rd. #321

Koloa, HI 96756

2015A168

GROUP 70 INTERNATIONAL

May 26, 2016

Mary Waldrop
marygwaldrop@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 Mary Waldrop:

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.

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-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

MARTIN & DEIRDRE WEIL
P.O. BOX 356
SONOMA CA 95476

RECEIVED
FEB 23 2015
GROUP 70 INTL

February 19, 2015

State of Hawai'i, Department of Health,
Attn: Laura McIntyre
1250 Punchbowl Street,
Honolulu, HI 96813

RE: Hawaii Dairy Farm, Mahaulepu, Kauai

Ms. McIntyre et al,

I am writing to oppose the establishment of a commercial dairy enterprise at Mahaulepu, immediately adjacent to Koloa and the Poipu Beach area.

My wife and I have owned our condominium at Poipu Kai, Poipu Beach since 1994. We first visited Kauai in 1983 just after Ewa and have been to the island every year since. We have witnessed many changes in those 30-plus years, not all of them good. Like many, we rued the disappearance of the pineapple industry and even at times the ascendancy of the tourist industry. As a business person, I completely understand the desire to create more, non-tourist, industry and employment on the island. The dairy farm may be an excellent addition to Kauai but its proposed location is simply unacceptable given the intense visitor infrastructure it would impinge upon.

The environmental impacts represent a potential hazard for both tourist and local alike. Siting this farm immediately adjacent to Koloa/Poipu Beach would risk great damage to this thriving tourism economic engine on Kauai. For the average tourist who comes to Kauai and spends a considerable amount of money during their stay, a few cows can be picturesque. But hundreds, or thousands, would be a noxious, odorous and fly-infested nightmare. It would not take long for the Kauai "brand," one built up with so much effort in the decades since Iniki, to be severely damaged. Once damaged, it could take many years again to restore the highly-desirable idyllic image of the island.

I will not belabor the obvious negative impact on tourist property values and the specific economic costs to my family and to all those who have invested in Kauai over the years. This potential self-inflicted wound is eminently avoidable. I am certain there are numerous alternate locations for this business endeavor on Kauai. Every effort should be made to find one.

Thank you for your attention.

Sincerely.

Martin Weil
Owner, Kahala 112
Poipu Kai, Koloa HI

Cc: Group 70 International, Inc., 925 Bethel Street, 5th Floor, Honolulu, HI 96813
Hawai'i Dairy Farms, LLC., Attn: Jeff Overton P.O. Box 1690, Kōloa, HI 96756-1690
Friends of Mahaulepu, P.O.Box 1654 Koloa, HI 96756

May 26, 2016

Martin Weil
P.O. Box 356
Sonoma, CA 95476

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 Weil:

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.

We will provide you with a copy of the Environmental Impact Statement. Thank you for your participation in the environmental review process.

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: cwelti@gmail.com on behalf of Cynthia Welti <cynthia@welti.us>
Sent: Monday, February 23, 2015 4:54 PM
To: HDF; epo@doh.hawaii.gov
Subject: Hawaii Dairy Farms EIS Comment

To Hawaii Dairy Farm,

I have read the Environmental Impact Statement Notification and write to endorse this proposal. I realize there has been a lot of strongly voiced opposition. However I believe we need locally-sourced milk and grass-fed is so much better for our health and environment than cows in barns being fed corn. Because of problems with conventional dairies elsewhere people will oppose any proposed dairy wherever it may be.

I appreciate this being proposed on land which is zoned for it. There are many positive elements in the EISN, especially starting with 699 cows and monitoring the effluent. It is good to see modern sustainable practices and the use of solar power.

Most of all I believe as is stated, with the "need to increase food security for island communities, the establishment of sustainable dairies will be vital to Hawaii's future."

Sincerely,
Cynthia Welti
Kapaa

May 26, 2016

Cynthia Welti
cynthia@welti.us

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 Cynthia Welti:

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.

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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.

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

Coni Wesland

RECEIVED
FEB 24 2015
GROUP 70 INTL

February 20, 2015

To whom It May Concern ; and it I'm very concerned about the proposed dairy farm planned at Maha'ulepu in Kauai.

I live approximately two miles from project and from studies that I have read about the location, I believe it effects not only my area, but in one way or another, the whole island.

Main concerns are how it can contaminate our ocean, our drinking water supply, our air, our insect population and eventually our tourist industry.

Studies from other sources, such as New Zealand, concerning dairy operations are frightening . Why would anyone living on pristine Kauai take any chances of destroying any part of it? Someone that doesn't live on it?

I join my neighbors and friends and vote "No dairy farm at Maha'ulepu !

Coni Wesland

A concerned resident

1831 Poipu Rd., Apt. 422 . . . Koloa, HI 96756

May 26, 2016

Coni Wesland
1831 Poipu Road, #422
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 Coni Wesland:

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:

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.

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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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

Hawai'i Dairy Farms

MAHA'ULEPU, KAUA'I

RECEIVED

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: AC WHITE Organization: ALOHA SPICE COMPANY

Preferred contact Method

Email: alayla1@msn.com Postal Address:

Phone: (Optional)

Comments: 1) SINCE HARDLY ANYONE BELIEVES THIS IS AN APPROPRIATE LOCATION FOR A DAIRY THIS SIZE, WHAT ARE THE SAFEGUARDS IN PLACE FOR CLEANING UP THE MESS AFTER THE FAILED DAIRY LEAVES? IS HDF GOING TO RETURN MAHALE'UPU TO PRE-DAIRY CONDITIONS? IS GROVE FARM? ARE WE THE TAX PAYERS?
2) WHAT IS THE ENVIRONMENTAL IMPACT OF HAVING TO SHIP THE RAW MILK TO OAHU FOR PROCESSING. WOULDN'T MAKE MORE SENSE TO HAVE THE DAIRY CLOSE TO THE PROCESSING PLANT?
3) WHAT IS WRONG WITH THE OLD DAIRY SITE IN MOLOAA? THAT SEEMED LIKE AN IDEAL SPOT FOR A DAIRY. DOES THE OWNER OF THE NEIGHBORING PROPERTY STILL OBJECT? WHY? IS HIS ARGUMENT VALID?

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

Allan B. White
P.O. Box 205
Hanapepe, HI 96716-0205
alayale@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 Allan B. White:

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.

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: William Whitney <wmyrlwhitney@gmail.com>
Sent: Saturday, February 21, 2015 9:54 AM
To: HDF
Cc: epo@doh.hwasii.gov
Subject: HDF-EIS Comments
Attachments: img009.jpg

Follow Up Flag: Follow up
Flag Status: Completed

Comments for HDF meeting 19 Feb Koloa

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: BILL WHITNEY Organization: SELF

Preferred contact Method

Email: wmyrlwhitney@gmail.com Postal Address: 1470 WANAAO RD KAPAA, HI 96746

Phone: (Optional)

Comments:

- WILL ANOTHER EIS BE REQUIRED IF YOU EXCEED 699 COWS?
- WILL THE EIS INCLUDE A SECTION ON IMPACT, PRO OR CON, TO THE SOUTH SHORE TOURIST INDUSTRY - JOBS, FINANCIAL, ENVIRONMENT
- HOW WILL A CATASTROPHIC SYSTEM FAILURE TO THE ENVIRONMENT BE MITIGATED?
- IS THE FORMER DAIRY SITE NEAR KILAUEA AN "ALTERNATIVE DAIRY LOCATION"?
- I WOULD LIKE TO COMMENT ON THE FEB. 19TH PRESENTATION. THE PRESENTATION AT THE KOLOA SCHOOL WAS REALLY WELL DONE. A VERY NICE FORMAT.

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

William Whitney
1470 Wanaano Road
Kapaa, HI 96746
wmyrlwhitney@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 William Whitney:

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.

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).
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- 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).
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- 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: Sequoya
To: epo@doh.hawaii.gov; HDF
Subject: Maha"ulepu Dairy EIS
Date: Monday, February 23, 2015 9:41:48 PM

To whom it may concern:

This is a comment about the Draft EIS for the Hawaii Dairy Farms planned dairy in Maha'ulepu.

I am a trained economist with a focus on natural resources management. I have lived on Kaua'i for about five years and have been coming here for 14 years, typically staying on the south shore.

My suggestions for what the EIS should examine include:
--waste management
--potential for waste run off and how it will be controlled
--potential for contaminating water supplies, especially the municipal wells in close proximity to the site
--air quality protection
--potential for nuisance flies or any other manure-related pests and how they will be controlled

Thank you.

Respectfully,
Susan Wiener

GROUP 70 INTERNATIONAL

May 26, 2016

Susan Wiener
energysavant@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 Susan Wiener:

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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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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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.

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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-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 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: Mark Wilcox <markwilcox210@sbcglobal.net>
Sent: Sunday, February 22, 2015 11:42 AM
To: HDF
Cc: epo@doh.hawaii.gov
Subject: Environmental Impact Statement Response and Comment

Hawai'i Dairy Farms, Environmental Impact Statement Comment

By Mark Wilcox, 2640 Puuholo Road, Koloa, HI 96756

The other day, I heard an old song on my car radio. The refrain went like this:

Don't it always seem to go
That you don't know what you've got
Till it's gone.
They paved paradise
And put up a parking lot.

I fear that this kind of paradise destruction is in store for Kaua'i's lovely Maha'ulepu Valley. Except instead of asphalt, the land will be paved in manure—cow manure.

Using Hawai'i Dairy Farms' (HDF) own figures, one cow will produce 143 pounds of manure each day. That's daily! With a projected herd of 2000 cows, that is 143 **TONS** of manure every single day!

This makes me think of the cattle factory farms I pass by on I-80 in Nebraska. The stench cloud from the cow manure there is horrific to drive into and through. The airborne hydrogen sulfide/ ammonia gas combination stings the eyes and assaults the nose. This is what HDF plans to foist onto the South Shore and release into our trade winds? Downwind Po'ipu and Koloa will be devastated. Residents will gag, and the stench will chase visitors and vacationers out of Po'ipu and most likely off Kaua'i. The South Shore will experience vacant rooms, shuttered tourism-related businesses, collapsing real estate prices, job losses, bankruptcies, and foreclosures. Locals will be unable to sell their homes because no one will want to buy a house or condo in Koloa or in Po'ipu as long as an industrial dairy farm operates "next door."

As a young boy I was taught that I was basically free to do anything I wanted as long as "it did not touch someone else's nose." HDF's proposed factory farm will be "touching my nose" in a most nauseating manner. HDF needs to move to another location—a location where the smell of manure will not assault resident and visitor senses.

And don't get me started on percolation rates, clay soils, run-off, flies, ocean pollution, seal and whale endangerment, e-coli bacteria, well contamination, ….

GROUP 70 INTERNATIONAL

May 26, 2016

Mark Wilcox
2640 Puuholo Road
Koloa, HI 96756
markwilcox210@sbcglobal.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 Mark Wilcox:

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.

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.

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

Via Certified Mail, Return Receipt Requested:

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Department of Health
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Group 70 International, Inc.
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laura.mcintyre@doh.hawaii.gov

RE: Environmental Impact Statement

Dear Ms. McIntyre:

This letter is in response to Hawai'i Dairy Farms request for comments on their Environmental Impact Statement. Although I attended the meeting on February 19th at the Koloa School cafeteria, my concerns were not specifically addressed in any of the focus groups. Therefore, I am taking this official opportunity to voice my concerns and request that specific needs and issues for the communities of Po'ipu and Koloa be addressed.

While I have issues with all of the Significant Criteria listed on page 23 (approximate since no page numbers are listed) of Hawai'i Dairy Farms Environmental Impact Statement Preparation Notice, my comments in this document will specifically refer to 4.1.4 as follows:

4. Substantially affects the economic or social welfare of the community or State;

SOCIAL WELFARE

Quality of life issues related to the structure and scale of agriculture have been examined since the 1930s. It is widely recognized in the literature that the social fabric or social capital of communities undergoes significant change as industrialization of agriculture takes place. In general, communities with greater social capital or social fabric provide greater quality of life. This social fabric of communities undergoes significant change as the industrialization of agriculture takes place.

Research reveals specific examples of how CAFOs disrupt social capital:

- increases in crime rate and civil suits
- increase in local police
- increased stress and social psychological problems
- deterioration of relationships between farmers and their neighbors
- more stressful, less neighborly relations
- decline in community services, leaving an area with fewer/ poorer quality public services.
- negative assessments of trust, neighborliness, networks of acquaintanceship, democratic values, and community involvement.

Several of the above points are **already happening** in the Po'ipu community!

A six-county study in southern Minnesota reported three patterns that typically reflect the decline of social capital resulting from the siting of CAFOs in ALL six rural counties:

(1) widening gaps between the farmers who produce livestock within CAFOs and their neighbors, including non-CAFO livestock producers;
(2) harassment of vocal opponents of CAFOs; and
(3) perceptions by both CAFO supporters and opponents of hostility, neglect, or inattention by public institutions that resulted in perpetuation of an adversarial and inequitable community climate.

Again, #2 and #3 are **already occurring** in the Po'ipu community.

One of the most significant social impacts of CAFOs is the disruption of the quality of life for neighboring residents. More than an unpleasant odor, the smell can have dramatic consequences for communities, like Kaua'i, where lives revolve around enjoying the outdoors. Large-scale livestock facilities near homes significantly disrupt community living. Highly cherished values of freedom and independence associated with life oriented toward the outdoors give way to feelings of violation and infringement. Social gatherings where family and friends come together are affected either in practice or through disruption of routines that normally provide a sense of belonging and identity—backyard barbecues, luaus, and visits by friends and family, for example. Homes are no longer an extension of, or a means for, enjoying the outdoors. Rather, homes become a barrier against an outdoors that must be escaped.

Conflicts emanating from CAFOs polarize residents and tear at the fabric of community life, transforming neighbors into enemies, and severely straining friendships and family relationships. In addition, because local activism depends on the mobilization of volunteered efforts and resources, it demands an obsessive identification with "the cause." This contrasts with the purchased human resources and expertise available to Hawai'i Dairy Farms. Not only does this obsession rigidly define "sides" within a small population, but it can also result in the physical and mental exhaustion of heavily committed residents and the deterioration of communities.

ECONOMICS

Income

Fifty years of studies demonstrate that the encroachment of CAFOs upon communities results in lower relative incomes for certain segments and greater income inequality and poverty, a less active Main Street, decreased retail trade, and fewer stores in the community. Farms with a gross income of $100,000 make nearly 95% of their expenditures locally, while farms with gross incomes in excess of $900,000 spent less than 20% locally. This means that most dollars made by the CAFO do not stay in the community and help it to thrive, but instead leave the community, draining it economically.

Employment

Often, CAFOs are touted as increasing employment within the rural communities they are near. However, the emphasis on efficiency of CAFO operations, relying heavily on technology rather than labor, actually leads to higher unemployment rates in those communities. On the rare occasion that such growth is realized, the growth is usually not strong enough to reverse out-migration that could be attributed to the CAFO. There is no multiplier effect of dollars being spent locally when large corporate-owned CAFOs are built in a community.

Decreased Property Values

Industrialization of animal agriculture leads to the reduced enjoyment of property and deterioration of the surrounding landscape, reflecting in declining home values and lowering of property tax assessments. Proximity to confined animal feeding operations is the reason property tax assessments have been lowered in eight states. CAFOs can generate flies, odors, and other externalities that decrease land values near facilities. These risks also depress property values in communities near CAFOs. An assessment in Missouri estimated that property values near CAFOs had fell a total of about $26 billion.

CONCLUSION

When the economic and social benefits of industrialized livestock production are compared to other alternative uses of land and water resources, typically the alternatives are more beneficial. The positive economic, social, and human development impacts of CAFOs are, at best, modest.

Based on scientific literature and decades of studies supporting all of the above concerns, I request that HDF research and produce a financial report **objectively** outlining all economic benefits and deficiencies stated in this letter that will affect the communities of Koloa and Po'ipu (short and long-term), if a CAFO is sited at Māhā'ulepu Valley.

Hawai'i Dairy Farms is proposing to take much away from the communities of Koloa and Po'ipu, which is not rightfully theirs to remove. I request that an official document be constructed outlining and benchmarking how Hawai'i Dairy Farms will rectify the damaged

social fabric and freedoms of the Koloa and Po'ipu communities and how HDF will become and continue to be, a positive, integrated, and long-term social contributor.

Respectfully,

Kelly Wildman
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Phone: 541-745-7053
Email: kelly@wildrivernet.com

GROUP 70 INTERNATIONAL

May 26, 2016

Kelly Wildman
1017 NW Alder Creek Drive
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kelly@wildrivernet.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 Kelly Wildman:

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.

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 Kaua'i, 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.

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 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 21, 2015

State Of Hawai'i
Department of Health
1250 Punchbowl Street
Honolulu, HI 96813

RECEIVED
FEB 24 2015
GROUP 70 INTL

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

To whom it may concern:

I would like to register my comments on the Scope of the Environmental Impact Statement (EIS) concerning the proposed industrial dairy at Maha'ulepu, Kaua'i. I understand that after describing my concerns, I will be allowed to continue in the EIS process and be assured the ability to provide future comments. I am concerned with all 13 Categories of Significance Criteria identified in the HAR Chapter 200, but I would like to concentrate my comments on Criteria 7, 10, and 11. My concerns revolve primarily, around the environmental issues involved with Hawaii Dairy Farms (HDF) planned industrial dairy operation.

Although I am not a resident of Hawai'i, I have spent annual vacations on Kauai for the past 16 years. To provide an understanding of my background, I attended the University of Hawai'i – Manoa in 1974, received a bachelor's degree at Drake University and a Masters Degree in Water Resources Management at the University of Wisconsin – Madison. The emphasis of my Masters work was 208 Water Quality planning in association with dairy farms in southern Wisconsin. I am quite familiar with dairies and their impact on streams and the environment. For the past 30 years, I have been on the faculty at Oregon State University as a fish biologist and stream ecologist.

It will be impossible for HDF's large scale dairy operation to be a "Zero-point source discharge, meaning 100 percent of the cow's manure will remain on the farm as fertilizer for the pasture grass" as stated in the HDF Environmental Impact Statement Preparation Notice.

Kaua'i receives some of the greatest amounts of rainfall anywhere on earth. Even the dryer south side of the island can receive large quantities of rain within a 24 hour interval. In addition, long intervals of 10 to 20 consecutive days can receive moderate to heavy rainfall. Incidents of heavy rain for the Maha'ulepu area can be observed by using rainfall records from the nearby rain gauge. Rainfall records from the weather gauge at Po'ipu /Maha'ulepu indicate that, in the past 5 years, there have been numerous rain events within a 24 hour interval which have exceeded 2 inches.

Below is a summary of my concerns with HDF's planned industrial dairy operation at Maha'ulepu:

SOILS

In the document entitled "NRCS Conservation Service Plan" prepared by HDF, it indicates that the soils at the site are volcanic in origin and would be readily absorbed rainfall. For this dairy to operate at a zero-point source level, soils would need to be favorable for nutrient absorption. However, recent documents from HDF indicate that the soils at the site are not porous volcanic soils but are, instead, poorly drained clay like soils. Soils at the site now have been indicated as being Ka'ena clay and Kalihi clay. These soils are not porous and will lead to overland flow of rainfall and applied diluted effluent by irrigation. The draft EIS will need to address, in detail, the extent of these poorly draining soils and their proximity to Waiopili Stream as well as Mill Ditch and all other ditches that have flowing water within the dairy operation.

BUFFER STRIPS

After studying the environmental implications from dairy operations for my Masters degree at Wisconsin, "America's Dairyland", a common practice for limiting runoff from dairy operations into surface waters is with the use of buffer strips. Buffer strips of well vegetated zones consisting of grass and shrubs/trees along the sides of a stream can act to limit, and even absorb, nutrient runoff from nearby dairy operations. Typically, buffer widths of 200 feet are implemented if downstream uses of water are for recreation, drinking water, or if endangered species inhabit stream waters. If none of these issues exist, then buffer strips of 100 feet can be used, but the ability of nutrient absorption is reduced. The downstream reaches of Waiopili stream, specifically the area where the stream enters the ocean at Gillin's Beach, is used extensively by visitors and residents alike for recreation.

HDF's plan indicates a buffer strip of 50 feet for streams, agricultural water and natural water resources. Fifty feet of riparian buffer will be inadequate to stop manure from entering surface waters. Waiopili stream will receive dairy effluent during storm events and will transport the material to the ocean at Gillin's Beach. Over the years, I have witnessed and documented numerous events where the ocean is brown with runoff materials at Maha'ulepu. This runoff is partially coming from the low levels of cattle grazing already operating in the area. Even with this existing low level of grazing, Waiopili stream is providing large amounts of sediment to the ocean and is limiting the recovery of corals in the area.

Water quality monitoring by both Hawaii Department of Health and by Kauai Surfrider indicate high levels of E. coli in Waiopili Stream as well as in the ocean directly out from Gillin Beach. With the levels of E. coli presently being the highest of all streams on Kauai, there is a responsibility of the state to limit development in the area so that these already high levels of E. coli do not continue to increase.

In HDF's EIS Preparation Notice, they state in the section labeled Surface Water Resources, the "Area has a system of ditches ('auwai)." Furthermore they state "Several ditches exist between these north-south running ditches to drain the fields. Mill ditch forms the southern boundary of the parcel, which flows into Waiopili Stream and then discharges to the ocean at Maha'ulepu. Beach". If these ditches "Drain the fields" as stated in the Notice and enter the stream ecosystem, they will eventually end up into the marine environment. This is definitely not a "zero-discharge system". A thorough and detailed examination of the likelihood of nutrients entering the freshwater ditches and streams of the area will need to addressed in the prepared EIS.

Furthermore HDF's Preparation Notice, Section 3.3 INFRASTRUCTURE, subsection Drainage and Storm Water Runoff, gives more details about the ditch system by stating: "The project has been used for previous agricultural and grazing activities, and has a system of ditches to channel storm water through the area as well as to drain the fields". Draining the fields where grazing cows are defecating/urinating is EXACTLY what is to be avoided. The EIS will need to document, in detail, how storm waters will be managed and how they will be prevented from entering surface waters systems.

A secondary route where urine/manure can enter the freshwater ecosystem is through the aerial application of diluted effluent onto the pastures. Spray drift is a common problem and wind conditions are critical factors for proper application of effluent upon these systems. Literature that HDF has provided does not indicate what the maximum threshold wind spread limit is when the irrigation of effluent is terminated. Will the effluent be irrigated if the typical trade winds are prevailing? After several years of preparation work at the site, HDF must realize that strong winds are common. Winds will carry the aerial application of effluent past intended pastures and into areas such as ditches, streams, and riparian buffer zones. How will the wind speed be determined at the site? Will wind speeds be measured by the use of anemometers and how many units will be located at the site? Where will anemometers be placed? How often will wind speed levels be measured? Who will be measuring the wind speed or will it be done automatically? Are aerial applications of the effluent through irrigation done day and night? All of these factors will need to addressed in the prepared EIS.

When effluent enters the ditch system, either by overland flow or by spray drift from aerial effluent application, what will be the protocols for documenting the oversight? Will there be a system in place to filter the fresh water ditch system of contaminants? Who will be monitoring the water quality in the ditch system and in Waiopili Stream? How often will water quality be monitored in these surface waters?

During heavy or prolonged rainfall events contaminated waters will flow through the ditch system, including Mill ditch, and into Waiopili Stream and eventually into the ocean. There are numerous species, endemic and endangered within the freshwater system that will be affected. The following are some, but not all, of the freshwater species that will be affected and thus will need to be addressed within the EIS.

Waterfowl:

There are five waterfowl species presently listed as endangered by the IUCU (International Union for the Conservation of Nature). This organization is the worlds' main authority on the conservation status of sensitive species. Species known to be present at the proposed dairy site are:

Hawaiian Duck (*Anas wyvilliana*)
Hawaiian goose (*Branta sandvicensis*)

Hawaiian common moorhen (*Gallinula chloropus sandvicensis*)
Hawaiian coot (*Fulica americana alai*)
Hawaiian stilt (*Himantopus mexicanus knudseni*)

I have witnessed and photographed the Hawaiian duck feeding and loafing in Waiopili Stream near its junction with the ocean at Maha'ulepu beach. This species, along with the other four species, would be adversely affected if the water quality of Waiopili stream becomes more degraded than its present level. The EIS preparation will need qualified personnel to conduct rigorous surveys detailing the level of use by these five endangered birds known to occupy the area.

AQUATIC INVERTEBRATES:

There is nothing indicated in the Preparation Notice concerning aquatic invertebrate surveys. A survey of aquatic invertebrates will need to be conducted in order to understand the possible impacts from the proposed dairy on these organisms. The five listed bird species in the area all feed on aquatic invertebrates such as Odonata and Diptera. Understandably, terrestrial arthropods need to be surveyed but aquatic invertebrates should not be overlooked as important organisms that will be affected by changes in stream water quality. There are 23 species and subspecies of damselflies that are endemic to the Hawaiian Islands along with 5 endemic dragonfly species. Have surveys been conducted for the presence of the endangered Pacific Hawaiian damselfly (*Megalagrion pacificum*) at this proposed site? The EIS will need to document if any of these endemic or endangered organisms are present in Waiopili Stream or any other waters running though the proposed site.

FISH:

There is nothing stated in the EIS Preparation Notice concerning the presence of fresh water fish in Waiopili Stream. I have observed fish in this stream on numerous occasions. Without the necessary permits and collecting gear (backpack electrofisher, seine) I do not know the species of these observed fish. Since Mill Ditch is fairly large in size and with perennial flow, I would postulate that it too has a native fish community. No information is provided on how the native fish community will be affected with this proposed industrial dairy.

Kauai has five freshwater endemic fish species. All are anadramous, with the adults living and spawning in streams but hatching larvae drift downstream to the ocean to live part of their life cycle. The five species of freshwater fish are:

Strangetailed flagtail (*Kuhlia xenura*)
Hawaiian freshwater goby - Oopu alamoo (*Lentipes concolor*)
O'opu naniha (*Stenogobius hawaiiensis*)
Sandwich Island sleeper (*Eleotris sandwicensis*)
Stimpson's goby (*Sicyopterus stimpsoni*)

Both *Stenogobius hawaiiensis and Eleotris sandwicensis* are endemic and are unable to pass steep torrents. These species may be present in the freshwaters of Waiopili Stream and the ditch system at the proposed dairy site. Fish surveys using backpack electorfishers and/or seines will need to be conducted for the EIS to determine their presence and abundance.

In section 4.2 HDF states that "Long-term effects to the environment are expected to be minimal". I believe strongly that this statement is incorrect and there will be short and long term environmental damages from this industrial dairy operation. In addition to the effects on individual components of the ecosystem, there are obvious cumulative effects from this proposed dairy facility that would greatly alter the economy and environment of the Island of Kauai'i. Both freshwater and marine systems in the south shore area of Kauai would suffer substantially, tourism and the personnel employed by the tourism industry would be greatly altered and in all reality, HDF would be liable for such damages, from state and federal agencies, as well as from private individuals and corporations.

I truly hoped an independent contractor would be preparing the EIS for this proposed dairy operation. Group 70 International, Inc., who has worked closely with HDF in the past, is preparing this EIS. This leads me to believe the document may be biased and the public and the State of Hawai'i should not conclude that all statements in the EIS are based on sound science or objectivity.

Thank you for your time and please feel free to contact me if you have any questions. I look forward to following the process of this EIS.

Sincerely,

Randall Wildman

Randall Wildman
Water Resources Management, MS
1017 N.W. Alder Creek Drive
Corvallis, OR 97330

May 26, 2016

Randall Wildman
1017 N.W. Alder Creek Drive
Corvallis, OR 97330

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 Randall Wildman:

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.

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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.

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.

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.

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 Hawai'i
Department of Health
1250 Punchbowl Street
Honolulu, HI 96813

February 10, 2015

Aloha, Fellow Lovers of our islands as they have always been,

I cannot speak to the environmental science of allowing a huge number of a huge bodied non-native species to be so close to the ocean. I cannot say what harms might be done to ground water or to the sea water. I do hope that whatever these problems might be, they are given proper thoughtful weight and the money involved is not any (even unconscious) determinant at all. I know that is difficult because rich people seem to have a gravity all their own and I know studies show that their jokes get laughed at longer and harder and they get smiled at more than the rest of us.
My family thinks such references to moneyed folk are rude. That's another advantage of being rich; people pretend not to notice.

My wife, children and I are long time visitors to Kaua'i since 1979 when we moved to the Po'ipu area (Spouting Horn Road) before I got into a boatbuilding school in Tacoma which I had been on a three years waiting list for and at that time moving back to the mainland.

We always stay in Po'ipu and frequently go to Maha'ulepu beaches when on the island and love them very much. I am reminded of our Forrest Park in Portland which is a haven within the city boundaries for those who want to be totally in Nature. We go there and are glad to drive very carefully on a deeply rutted road which we feel does not discourage visits so much as it slows us all down to the proper tempo, "island tempo", we call it.

I fear the presence of the proposed dairy will impact our pleasure and reverence for this sacred area by introducing repulsive smells and inescapable awareness of the cow's invasive bodily functions which we find all over our state of Oregon and where I came from in Virginia.

1) Unless there is a shortage of milk and 2) unless there is strong evidence children will suffer from its lack and 3) unless this very particular area is the only alternative, then I urge you to disapprove the siting of the proposed dairy in this special of all spots.

On the other side, all I can see is people who are used to getting their way no matter what others think and their, to me, mirky ambition to make impact with their lives. Surely profiting from the dairy does not amount to any blip of percentage of their total wealth--not even a rounding error, and their must be other factors at play. Those factors could be further and greater financial development of various kinds or could be just as inglorious as wanting others to have a(n olfactory) proof of their importance--a variation on what graffiti must mean for some of the street "artists" who present themselves to us by that means.

To me, sometimes in thinking hard about this very subject, I am taken to other considerations of anti-neighborliness such as I am aware of when I too often see broken glass at the base of sliding boards my grandchildren use at the public parks. (I mean it just has a certain strong and offensive reek to it which is not aloha...not pono.)

I appreciate deeply the important work you do in keeping all of us healthy and safe, and I wish you long and happy lives carrying out your great responsibilities bravely and, if needed, defiantly.

Yours very sincerely,

Bob Williams

Bob and Jeanette Williams
3945 Willow Flat Rd.
Hood River, Oregon 97031
541-490-1600
541-490-1818

May 26, 2016

Bob and Jeanette Williams
3945 Willow Flat Road
Hood River, OR 97031

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 Bob and Jeanette Williams:

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

From: Cjbwilliams@aol.com
Sent: Sunday, February 08, 2015 6:47 AM
To: HDF
Subject: Mahaulepu dairy farm

Follow Up Flag: Follow up
Flag Status: Flagged

These articles say it better than I could. Many examples of what could go wrong with the cows on Kauai are addressed. Carol Williams, Koloa, HI

From: ronniecummins@organicconsumers.org
To: cjbwilliams@aol.com
Sent: 2/6/2015 6:21:04 A.M. Pacific Standard Time
Subj: Cowbells for #milktruth?

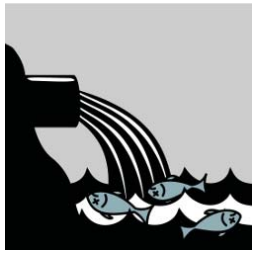
Organic Bytes

Health, Justice and Sustainability News from the Organic Consumers Association

A weekly e-newsletter edited by Katherine Paul and Ronnie Cummins

ESSAY OF THE WEEK

Cleaning Up after Big Ag



A "Cow Palace" in Washington State that threatens public health with its acres of untreated animal waste. A city in Iowa spending $1 million a year to keep illness-causing nitrates

from farm runoff out of public drinking water.

And who can forget the plight of Toledo, Ohio, residents whose water last summer was so contaminated by farm runoff that they couldn't even bathe in it, much less drink it?

For decades, America's chemical-intensive, industrial farming operations have spewed nitrates and other toxic chemicals, animal waste, ammonia, antibiotics, carbon dioxide, nitrous oxide and methane gases into public air, waterways and communities.

BLOG POST OF THE WEEK

Cowbells for #milktruth?

Last week, OCA's political and media consultant, Charlotte Warren, attended the International Dairy Foods Association (IDFA) conference in Boca Raton, Fla. There she learned that Big Dairy is feeling "under attack" by consumers who, well, simply want to know what's in their milk and cheese, how factory farm dairies treat their animals, and by the way just how much pollution are those farms unleashing into U.S. waterways?

But instead of focusing on addressing consumers' legitimate concerns, Warren learned, Big Dairy has hired public relations firms and a team of young social media wizkids to post and tweet about the wonderful wholesomeness of milk (produced in unwholesome conditions using unwholesome practices).

Conference sessions included, "Partnering across the Dairy Industry to Better Understand Consumers," "Top Hot Button Issues Keeping Dairy Executives Up at Night," and "The Food Dialogues: Animal Care and Consumers' Emerging Expectations."

But the best session of all was "Telling the Milk Story: Safeguarding Consumer Confidence in Milk's Goodness," which included the launch of the "Get Real" social media campaign, complete with hashtag (#MilkTruth). And cowbells.

follow on Twitter | friend on Facebook | OCA on Pinterest

Please forward this publication to family and friends, place it on web sites, print it, duplicate it and post it freely. Knowledge is power!

Organic Bytes is a publication of Organic Consumers Association

6771 South Silver Hill Drive - Finland, MN 55603 - Phone: 218-226-4164 - Fax: 218-353-7652

You are subscribed as:
cjbwilliams@aol.com

GROUP 70 INTERNATIONAL

May 26, 2016

Carol Williams
Cjbwilliams@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 Carol Williams:

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,

Group 70 International • 925 Bethel Street, 5th Floor • Honolulu, HI 96813-4307 • tel. 808.523.5866 • fax. 808.523.5874 • www.group70int.com

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.

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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: Laura Williams Organization: Kauai Comm. College

Preferred contact Method

Email: laurawilliams74@gmail.com Postal Address: Koloa

Phone: (Optional)

Comments: I am concerned about animal welfare.
How will animals be kept healthy?
Will they be given antibiotics/hormones?
How will this affect the water quality/effluent run off? or percolation?
How will you ensure animals are properly cared for?
What happens if they get sick? What will be done?
What happens if a pollution problem is found?

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

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OF COUNSEL

Ralph E. Portmore FAICP
Hitoshi Hida AIA

May 26, 2016

Laura Williams
laurawilliams74@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 Laura Williams:

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

From: Pearl Wollin [mailto:pvwollin@hotmail.com]
Sent: Friday, February 20, 2015 4:13 PM
To: EPO
Subject: Fwd: EIS for maha ulepu/ Hawai i Dairy Farms

Addendum: I am also curious as to whether or not Hawai i Dairy Farms intends to use hormones and antibiotics. If they do, that is an additional concern for our watersheds, wells and ocean.

Begin forwarded message:

From: Pearl Wollin <pvwollin@hotmail.com>
Subject: EIS for maha ulepu/ Hawai i Dairy Farms
Date: February 20, 2015 12:10:57 PM HST
To: epo@doh.hawaii.gov

Name: Pearl V. Wollin
email:pvwollin@hotmail.com

Comments: I attended the meeting last night, organized by Group 70, and have many concerns. The hiring of Group 7 was not an open bid; rather, Hawai i Dairy Farms, approached them. From the beginning, Hawai i Dairy Farms has not been honest in dealing with the citizens of Kaua i, and the DOH has been very lax in any kind of oversight. We first heard that a family farm was being developed, for milk for the keiki. Then we find that the owner is a billionaire, and this is his diversification. Most likely, Grove Farms has searched for a tenant for this land. The milk will not be processed here on the island, and there is a rumor that it will be sold to the military, and dry milk product will be sold on the world market. DOH did not do a study of the streams until local scientists began their own testing. So I am concerned about how accurate the results will be, as I know (retired faculty of academia) that data can be tweaked for desired results. I do not trust Group 7 nor DOH for this analysis, based on history of Hawai i Dairy Farms and DOH. (I sent you an e-mail some months ago about a community health concern, and did not even receive an automated response, let alone a reasoned reply.) So I recommend an independent review of the Group 7 results.

At the meeting, Group 7 held the meeting in a small school cafeteria, with the tables un-moveable, given the number of citizens who came to the meeting. My assumption is that this was a planned strategy, so that we could not have any meaningful comments in small groups. The hired facilitator used a well developed protocol, but that was the extent of the process. She talked over any comments from the citizenry, even the Native Hawaiian who pointed out that she was asking us to respect Group 7, but did not respect his request to begin the meeting

with a traditional blessing. In fact, there was no attempt to make this a cultural Hawaiian experience, other than having one of the sub-groups focus being culture and history, and some of the men wearing aloha shirts. Having a lavish food spread, which included cookies and milk didn't impress, as any thing other than a rich man's attempt to sweeten the audience.

I am concerned about there being a comprehensive sampling of the soil and water issues for the dairy, as well as surrounding lands. I live in Omao, and my own yard has different soils. One thing we do have on the South Shore is plenty of clay, which is just under the surface lava rocks.

I am concerned about the Hawai i Dairy Farms calling themselves "Grass farmers with a passion for dairy". What grasses will be used? Will they be grasses that sweeten the milk, as well as the soil? And there is no such thing as a zero discharge dairy. I grew up with family farms, and then lived in Snohomish County in Washington State for 23 years, while the farmers struggled with run-off and the salmon streams. We already have coral reefs threatened. I do not want this to be another example of going forward, and then the shocked recognition of the disastrous consequences.

GROUP 70
INTERNATIONAL

May 26, 2016

Pearl Wollin
pvwollin@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 Pearl Wollin:

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 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-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

RECEIVED

FEB 27 2015

GROUP 70 INTL

Dear EIS study folks, Feb 23, 2015

I am writing this letter to become involved in the current EIS process for the proposed dairy in Mahaulepu Valley. I am vehemently opposed to this dairy for numerous reasons, and feel strongly that it is the wrong land use for this vulnerable area.

I am not against a dairy, but a dairy in this particular location is a terrible idea. To be located right near the ocean with it's sensitive coral reefs and all the ocean plants and animals who depend on clean water threatens their existence. Mahaulepu is home to many endangered plants and animals and to threaten their existence with the addition of up to 2,000 cows and all the manure and urine they will deposit will impact all these things. This area has water wells which are very likely to become polluted as well. The health and livlihoods of so many plants and animals will likely be impacted, along with the human animals who have worked very hard to establish peaceful homes and businesses. To threated this area, all for the benefit of billionaire Pierre Oymidar and just a handful of others, needs to be studied very closely.

Please consider putting this dairy in a different location which is more suitable for this type of use. It is not fair to the plants, animals, and people who have already built their lives here, and will suffer because of the pollution and harm it will bring. Pierre Oymidar is already wealthy enough—please try doing something beneficial for the environment and his neighbors instead.

Sincerely,
Kerry Wolny
2229 Iukika Pl
Koloa, HI 96756
Kwolny123@yahoo.com

GROUP 70 INTERNATIONAL

May 26, 2016

Kerry Wolny
2229 Iukika 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 Kerry Wolny:

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 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 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

RECEIVED

FEB 27 2015

GROUP 70 INTL

From: **Pam** pamwolny@gmail.com
Subject: Dairy Opposition Letter
Date: February 23, 2015 at 11:27 AM
To: Pam pamwolny@gmail.com

To whom it may concern,

I am an owner of a popular vacation rental near the Grand Hyatt Resort and am writing this letter in opposition of the proposed dairy nearby in Mahaulepu.

We have owned and operated this business, bringing in tax revenue and jobs from this very popular tourist vacation destination, and feel that the proposed dairy will significantly impact the surrounding community and the numerous business owners in the area whose livelihoods depend on a pristine clean area, which is why we chose to buy and live here. These homes and businesses are here providing thousands of jobs and tax revenues for Kauai, and to put in a dairy adjacent to this area would be beneficial to just a handful of people, one on whom is already a multi-billionaire. Recent studies have shown that milk is not healthy for humans, and leads to premature death.

My educational background is an environmental studies degree from UC Santa Barbara. I was involved in investigating environmental issues and mock EIS and EIR studies. During this education, I learned how fragile the environment is, how interconnected it is, and how quickly it can be degraded. I spent a considerable amount of time looking into the New Zealand type of dairy farming, and spoke with several dairy educators who all believe that up to 2,000 cows on that small amount of acreage far exceeds the area's carrying capacity. Nowhere in my research did I find a grass-fed dairy with that many animals grazing on such few acres, or even close. I believe that the operator's greed to try to crowd so many animals in such a small space is based on the intent to maximize profits. Water wells which feed the local community are certain to become polluted. The health of the nearby community will surely be threatened with this dairy.

This proposed dairy will certainly cause irrevocable destruction of the sensitive habitat is would be located in!! Already, water samples have shown that under Grove Farm's stewardship, the water is already severely contaminated Before the dairy has even begun operations! The destruction of these natural and cultural resources adjacent to a popular vacation destination is just a terrible idea. The location of this proposed dairy next to the sensitive coral reefs, historical petroglyphs, vulnerable habitats, and beautiful topography is just the wrong place for a dairy. The clay soils are not good for the waste to decompose and there will be runoff into the waterways. The kikuyu grass is a very invasive species which may led to choking out native species.

Would the city of Honolulu ever consider putting a stinky, fly-ridden dairy adjacent to the popular vacation destination of Waikiki, which would harm thousands of businesses and the people and animals who reside there? I think not, and yet the government officials in Kauai are considering doing such a thing right here. A preposterous idea for such a special and sensitive place. To threaten the lives of so many people and animals and sea creatures and the once pristine environment it is located is crazy. The caretakers of this land have already shown to be very poor stewards of the land with the severely contaminated water even before the dairy is added. Why allow it to become even more polluted and threaten the livelihoods of the thousands who depend on it to support the already deep pockets of a single billionaire?

Sincerely,
Pam Wolny
2229 Iukika Pl
Koloa, HI 96756

GROUP 70
INTERNATIONAL

May 26, 2016

Pam Wolny
2229 Iukika 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 Pam Wolny:

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.

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.

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

dairy letr 21215

POB 189
Anahola 96703
21 Feb. 2015

Ms. Laura McIntyre
State of Hawai`i Dept. of Health
Office of Environmental Planning
919 Ala Moana Blvd. Room 312
Honolulu 96814

Aloha,

I could support the Hawai`i Dairy Farms project on Kaua`i if:

1) The only alternative to the proposed dairy were a housing or hotel development

2) The protection of Maha`ulepu's cultural and natural environment was assured

3) The HDF could guarantee that no flies, stence, effluent or other obnoxious byproducts of its operations could compromise local quality of life or endanger the health of our residents and visitors

4) The milk, butter, cheese etc. that the dairy proposes to manufacture would be primarily for Kaua`i residents

However, nothing I have read of the proposal convinces me that any of these conditions will be met. I therefore hope you will not approve this project.

Hei'ona Lani Wyatt

May 26, 2016

Hau'onalani Wyeth
P.O. Box 189
Anahola, HI 96703

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 Hau'onalani Wyeth:

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.

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: Gwen Yeo <gwenyeo@aol.com>
Sent: Wednesday, February 04, 2015 6:16 PM
To: HDF; Laura.McIntyre@doh.hawaii.gov
Subject: Hawaii Dairy Farms at Maha'ulepu

Follow Up Flag: Follow up
Flag Status: Flagged

Dear Mr. Overton and Ms. McIntyre,

Having grown up in a town where a beef feed lot was several miles outside the city, I am very aware of the impact a large herd of cattle can have on the quality of life of a community even miles away. We were always besieged by the sickening smell and constant armies of flies. The idea that 2000 cows would be fed and "housed" in a small parcel of land close to the pristine Maha'ulepu beach and a short distance from our island home in Makanui off Pe'e Road, is unthinkable to me.

It would be a disastrous decision to allow the dairy to be developed so close to what I consider to be the most beautiful hotel in the world. The Hyatt Grand is the greatest resource in the South shore of Kauai, and maybe the entire island. To make it less attractive because of odor and flies would not only be an unnecessary, terrible blow to the major economy of Kauai but a blow to the quality of life of a major section of those of us who are the population of Kauai.

Please consider the terrible impact on our wonderful island and its culture of such a misguided proposal.

Gwen Yeo

May 26, 2016

Gwen Yeo
gwenyeo@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 Gwen Yeo:

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.

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 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: Robert Zelkovsky <Robert@bamboomoonvideo.com>
Sent: Friday, February 20, 2015 9:52 AM
To: epo@doh.hawaii.gov
Cc: HDF
Subject: HDF IES

Thank you very much for the opportunity to ask questions that will be included into the EIS for HDF.
I have some environmental concerns regarding this concentrated dairy project.
I have lived on Kaua`i forty years and have seen several prolonged rain events. I have seen 2 15" rain days followed by a 10" rain day, all in a row.
Q - If the retention ponds are full or close to full because they are draining slowly, what will happen to the overflow? Soil can only hol so much water and waste and I envision massive flooding and runoff with prolonged heavy rain events. Independent testing of the area has shown it to be heavily polluted already. 2,000 cows produce tons of waste.
Q - also, during a heavy rain event, will the cows be milked? If they are on the cement walk area, milk area, and it is raining hard and the are eliminating waste, where will that go?

I lived on Long Island, New York before living here. There were many farms in the 60's. I used to surf there, carrying a 35 pound surfboard.
We used to get bit by flies, a very painful bite. We know that there will be flies associated with the cattle and their waste. It is my understanding that these flies, not house flies, have a 4 mile capability of flight. A four mile circumference from the dairy encapsulated Po`ipu, Koloa and all the way to Kaua`i Community College.
Q - What remediation will be present to deal with flies? Again, these are not common house flies.
Thank you,
Robert Zelkovsky
40 year Kaua`i resident

GROUP 70 INTERNATIONAL

May 26, 2016

Robert Zelkovsky
Robert@bamboomoonvideo.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 Robert Zelkovsky:

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.

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.

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.

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.

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: Jack Zimmerman
To: HDF
Cc: epo@doh.hawaii.gov
Subject: HDF Kauai, Hawaii
Date: Monday, February 23, 2015 1:00:29 PM

Aloha,
I would like to provide comments related to the HDF proposed operation on the south side of Kauai. I have lived on Kauai for over 37 years and cherish our beautiful Island. I cannot begin to express my disappointment with HDF for attempting to bring an ecological nightmare to this Island. We do not need a dairy farm polluting our precious environment and the natural resources surrounding the property (air, water table, and ocean). I have spent time in the Midwest and can only describe the odor generated from various livestock operations as disgusting and the land occupied by such farms are much larger than the Island of Kauai.

I would appreciate you withdrawing your planned operations and show some consideration for the aina and community here on Kauai. I have one question for the ownership of HDF, do you really need the money and shame on Grove Farm ownership for allowing the proposed HDF operations to move forward on this sacred land.

Respectfully,
Jack Zimmerman
1666 Kelaukia Street
Koloa, Hawaii 96756

May 26, 2016

Jack Zimmerman
1666 Kelaukia Street
Koloa, Hawaii 96756
zippytrip@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 Jack Zimmerman:

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.

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