Filename: HC&S/Aplic Table of Contents 4'12.doc

APPLICATION TABLE OF CONTENTS

A&B, INC.
HONOLULU

TELEPHONE: (808) 877-2959
FACSIMILE: (808) 871-7663

HAWAIIAN COMMERCIAL & SUGAR COMPANY
P.O. BOX 266, PUUNENE, MAUI, HAWAII 96784

April 13, 2007

Mr. Wilfred K. Nagamine
Manager, Clean Air Branch
State of Hawaii Department of Health
P.O. Box 3378
Honolulu, HI 96801

Subject: Revised Application for a Covered Source Permit No. 0054-01-C
Hawaiian Commercial and Sugar Company Puunene Mill

Dear Mr. Nagamine:

Enclosed is a revised application amending the initial Puunene Mill covered source permit application for compliance with the following applicable requirements:

- December 8, 2006, Consent Order
- New Source Performance Standards (NSPS) 40 CFR Part 60, Subparts A and D
- National Emission Standards for Hazardous Air Pollutants (NESHAPS) 40 CFR Part 63, Subparts A and DDDDD

To facilitate the Department's review, in addition to addressing the applicable requirements listed above, the application has been revised to reflect the results of testing, meetings, consultations and regulatory changes that have transpired since the original application was filed in 1994. The following paragraphs summarize the changes that have been made to the application as a result of the new applicable requirements as well as the changes included in previous correspondence. The enclosed application package includes new application forms and annotated revisions to the original CSP application.

Summary of Facility Changes Since the Original Application

The following types of changes have been made to the application to reflect changes that have occurred at the facility since the original CSP application was filed in 1994 and the new applicable requirements listed above.

- Changes to Significant Emissions Sources
  - Add propane as a startup fuel

- Add allowable biomass fuels
- Add cooking oil as an allowable fuel
- Perform routine replacement of Boilers 2 and 3 oil burners
- Clarify use of unwashed coal
- Increase Boiler 3 scrubber stack height
- Undertake improvements to Boiler 3 wet scrubber
- Add new food grade sugar dryer

- Changes to Insignificant Emissions Sources
  - Update list of insignificant sources and provide basis for exemptions

- Changes to Fuel Specifications and Limits
  - Increase allowable specification used oil use
  - Change sulfur content limit for specification used oil in Boilers 1 and 2
  - Revise Boiler 3 coal consumption limits
  - Clarify biomass boiler requirement

- Changes to Emission Limits
  - Revise Boilers 1 and 2 NOx and PM emission limits for coal to reflect actual rather than projected performance of the boilers on coal
  - Revise Boiler 3 emission limits to reflect compliance with the NSPS

- Changes to Monitoring, Recordkeeping and Reporting Requirements
  - Modify coal fugitive emissions control plan
  - Revise stack test report due date
  - Propose alternative opacity monitoring procedures
  - Propose fuel sampling and analysis procedures for Boiler 3

In addition, the application addresses several additional changes that are proposed at the mill.

- Eliminate #6 fuel oil as allowable fuel
- Implement the Phase I SEP for monitoring opacity of the Boilers 1 and 2 stack
- Implement the Phase II SEP for improved bagasse delivery system for the boilers
- Increase allowable specification used oil use from 1 million to 1.5 million gallons per year

<u>Changes to the CSP Application</u>

The attachments to this letter are as follows:

Attachment 1: Completed application forms (S-1, C-1 and C-2)
Attachment 2: Updated "Equipment Description" section of the original Covered Source Permit application
Attachment 3: Proposed Modifications
Attachment 4: Updated "Facility Emissions" section of the original Covered Source Permit application

Attachment 5: Updated "Compliance with Applicable Rules and Regulations" section of the original Covered Source Permit application
Attachment 6: Updated "Ambient Air Quality Impacts Analysis" section of the original Covered Source Permit application
Attachment 7: Summary of Revisions—Covered Source Permit Application No. 0054-01-C
Attachment 8: Procedure for Meeting Alternative Opacity Monitoring, Notification, and Recordkeeping Requirements – Puunene Boilers 1, 2, and 3

Changes to the original Covered Source Permit application are shown in Attachments 2, 3 and 4 as underlined text, with annotations that provide references to relevant or supporting correspondence. Additional permit changes that have not yet been submitted to HDOH are described in detail in Attachment 3. Attachment 5 is intended to replace Part II, Compliance with Applicable Rules and Regulations, of the original CSP application. An updated ambient air quality impact analysis, reflecting current regulatory requirements and the additional changes that are proposed in Attachment 3, is provided in Attachment 6. A detailed correspondence record was submitted in July 2005; an updated version of this correspondence record is attached as Attachment 7.

We look forward to working with you and your staff to complete the covered source permit review process for the Puunene mill. If you have any questions regarding this submittal, please contact Sean O'Keefe at (808) 877-2959.

Sincerely,

Frank E. Kiger
Senior Vice President, Factory Operations
Hawaiian Commercial and Sugar Company

attachments

cc: Sean O'Keefe, A&B
Derek Heafey, HC&S
Gary Rubenstein, Sierra Research

sierra research

Attachments to the Revised Application to the State of Hawaii Department of Health for Covered Source Permit No. 0054-01-C Hawaiian Commercial & Sugar Company Puunene, Maui, Hawaii

prepared for:

Hawaiian Commercial & Sugar Company

April 2007

prepared by:

Sierra Research, Inc.
1801 J Street
Sacramento, California 95814
(916) 444-6666

4

Attachment 1

Application Forms

Attachment 2

Equipment Descriptions Revised Since Original CSP Application
(only the revised portions of Part I, Section C, are shown)

2. General Purpose

Equipment at the Puunene sugar mill consists of sugar cane cleaning and processing equipment, storage and handling equipment, steam and electrical generation equipment, maintenance and repair equipment, and miscellaneous emergency and support equipment. The largest sources of air pollutant emissions are the spreader stoker boilers currently covered by permits to operate. These boilers currently provide process steam for the sugar milling operations; excess steam is used to generate approximately 46 MW of electricity, some of which is sold to Maui Electric Company.

3. Existing Facility

a. Steam Boilers

The Puunene factory, owned and operated by HC&S, consists of three bagasse-fueled steam boilers and three turbine generators, which provide a total steam output of approximately 540,000 lb/hr and a total electrical output of approximately 46 MW. Boilers 1 and 2, which are currently permitted to burn bagasse, coal, #2 and #6 fuel oil and specification used oil, are Riley spreader stoker units rated at 125,000 lbs/hr of steam production (212 MMBtu/hr) on bagasse. These units have a practical service rating on fuel oil of 135,000 lbs/hr (173 MMBtu/hr). Boiler 3, which is also permitted to burn #2 and #6 fuel oil, and coal as well as bagasse, is a Foster Wheeler spreader stoker unit rated at 392 MMBtu/hr on oil (437 MMBtu/hr during coal firing, and 568 MMBtu/hr during bagasse firing). All three boilers use small amounts of propane fuel for startup. All three boilers are equipped with full wet scrubbing systems for particulate emissions control. All three boilers have valid permits to operate and will continue to operate up to 24 hours per day and 8760 hours per year to provide steam and electricity for the sugar mill. Equipment specifications for the existing boilers at Puunene are shown in Tables 1R and 2R.

Typical fuel characteristics for all fuels burned at the facility are shown in Table 3R. Additional plant equipment that will need to be included in the covered source permit is described below.

Table 1R
Puunene Boilers 1 and 2

Manufacturer:	Riley Stoker
Model Number:	RX-29
Primary Fuel:	Bagasse
Backup Fuels:	#2 oil, 0.5% sulfur content; coal, 0.5% sulfur content; specification used oil, 0.75% sulfur content[1]; untreated wood chips, banna grass and other biomass[2]; confiscated agricultural material[3]
Other Fuel:	Propane (used on startup)[4]
Site Ambient Temperature, °F:	80°F
Air Inlet Temperature, °F:	80°F
Exhaust Outlet Temperature, °F:	156°F
Allowable Annual Hours of Operation	up to 8,760 hours/year[5]
Steam Output:	125,000 lb/hr each of 900 psig steam @ 760°F on bagasse and other biomass fuels; 135,000 lb/hr each for liquid fuels; 137,500 lb/hr each on coal

Performance Data
HC&S Puunene Mill – Boilers 1&2[6]
(all data are for each boiler)

	Bagasse and Other Biomass Fuels[2]	#2 Oil and Specification Used Oil[a]	Coal
No. of Burners	n/a	4	n/a
Burner Manufacturer	n/a	Peabody (2) Coen (2)[7]	n/a
Burner Model	n/a	H-23 "ABT" (Peabody) CRD-DAZ 26[7] (Coen)	n/a
Steam Production at Rated Output	125,000	135,000	137,500
Fuel Consumption at Rated Output	212 MMBtu/hr	173 MMBtu/hr	192 MMBtu/hr
	50,560 lbs/hr (as fired)	8,650 lbs/hr	10,127 lb/hr
		1,236 gal/hr	

Note a: Boiler performance data when burning specification used oil fuel is essentially identical to data shown for fuel oil #2.

Changes from the original CSP application:

1. The allowable sulfur content of the specification used oil in Boilers 1 and 2 was increased from 0.5% to 0.75%. (Ref: HDOH approval letter dated June 8, 2005)
2. Wood chips and other biomass fuels were proposed as other biomass fuels that should be added to the CSP. (Ref: HC&S letters dated August 5, 1999, and June 26, 2000)
3. Small quantities of confiscated agricultural material, consisting of flowers, foliage, fruits and vegetables in cardboard boxes, may be burned in the boilers. (Ref: HDOH approval letter dated November 28, 2000)
4. Propane was included as a startup fuel. (Ref: HC&S letters dated June 15, 1998, and June 23, 2000)
5. There is no limitation in the current permits on boiler hours of operation.
6. #6 fuel oil is being eliminated as a fuel in Boilers 1, 2 and 3 (see Attachment 3 to this revised application).
7. Two new Coen Model CRD-DAZ 26 oil burners were installed on Puunene Boiler 2 to replace two of the existing Peabody burners in 2000. (Ref: HC&S letter dated April 17, 2000)

Table 2R
Puunene Boiler 3

Manufacturer:	Foster Wheeler
Primary Fuel:	Bagasse
Backup Fuels:	#2 oil, 0.5% sulfur content; coal, 0.5% sulfur content; specification used oil, 0.5% sulfur content; cooking oil[1]; untreated wood chips, banna grass and other biomass[2]; confiscated agricultural material[3]
Other Fuel:	Propane (used on startup)[4]
Site Ambient Temperature, °F:	80°F
Air Inlet Temperature, °F:	80°F
Exhaust Outlet Temperature, °F:	156°F
Allowable Annual Hours of Operation	up to 8,760 hours/year[5]
Steam Output:	290,000 lb/hr of 425 psig steam @ 740°F

Performance Data
HC&S Puunene Mill – Boiler 3[6]

	Bagasse and Other Biomass Fuels	#2 Oil and Specification Used Oil[1]	Coal
No. of Burners	n/a	4	n/a
Burner Manufacturer	n/a	Coen	n/a
Burner Model	n/a	CPF 30[7]	n/a
Steam Production at Rated Output	290,000	290,000	290,000
Fuel Consumption at Rated Output	568 MMBtu/hr	392 MMBtu/hr	437 MMBtu/hr
	147,917 lbs/hr (as fired)	19,600 lbs/hr	43,152 lb/hr (as fired)
		2,801 gal/hr	

Note 1: Boiler performance data when burning specification used oil fuel is essentially identical to data shown for fuel oil #2.

Changes from the original CSP application:

1. Combustion of up to one million gallons of cooking oil has been determined to be an insignificant activity. (Ref: HDOH letter dated July 6, 2004) Approval to combust up to one million gallons per year of cooking oil has been requested. (Ref: HC&S letter dated May 31, 2004)
2. Wood chips and other biomass fuels were proposed as other biomass fuels that should be added to the CSP. (Ref: HC&S letters dated August 5, 1999, and June 26, 2000)
3. Small quantities of confiscated agricultural material, consisting of flowers, foliage, fruits and vegetables in cardboard boxes, may be burned in the boilers. (Ref: HDOH approval letter dated November 28, 2000)
4. Propane was included as a startup fuel. (Ref: HC&S letters dated June 15, 1998, and June 23, 2000)

5. There is no limitation in the current permits on boiler hours of operation.
6. #6 fuel oil is being eliminated as a fuel in Boilers 1, 2 and 3 (see Attachment 3 to this revised application).
7. Four new Coen model CPF 30 burners were installed in 1997 to replace the old Coen Model DAZ 36 burners. (Ref: HC&S letter dated March 5, 1997)

Table 3R
Typical Fuel Composition

~~Hawaiian Independent Refinery, Inc., No. 6 Fuel Oil~~[1]	
Australian Coal	
(no changes)	
Bagasse	
(no changes)	
#2 Fuel Oil	
(no changes)	
Specification Used Oil	
Specification	Value
Gravity, API	30-40
Flash Point, °F	>200
Sediment and Water, Wt. %	<2.0
Sulfur, Wt. %	≤0.75% (Boilers 1 and 2) <0.5% (Boiler 3)[2]
Heat Content, Btu/gal	140,000

Changes from the original CSP application:

1. HC&S is proposing to eliminate the use of #6 fuel oil at Puunene Mill. See Attachment 3 to this revised application.
2. Allowable fuel sulfur content for specification used oil in Boilers 1 and 2 is 0.75% by weight (Ref. HDOH approval letter dated June 8, 2005). Allowable fuel sulfur content for spec oil in Boiler 3 is still 0.5% by weight.

~~b. Motor Burnout Oven~~

~~This propane-fueled Bayco Model BB80 heat cleaning oven is used to burn varnish off the wiring in electric motors before the motors can be rewound. The oven is equipped with two burners, each rated at 500 MBtu per hour per burner, for a total heat input of 1 MMBtu/hr. The motor shop rewinds approximately 36 motors per year, and each motor requires approximately four hours in the oven, so the oven is in use approximately 144 hours per year. The oven is equipped with an integral afterburner system for clean combustion.~~

~~c. Hot Water Pressure Washer~~

~~A small oil-fired heater is used to heat the water used in the pressure washer. The washer is located at the wash rack adjacent to the southwest end of Tractor Shed Number 1, and is used to wash vehicles and heavy equipment. The Hotsy Model 5830A water heater is equipped with a SunTec Model A2YA-7916 Misted Fuel burner rated at 700 MBtu per hour. Use of the water heater is intermittent and is estimated at one to two hours per day.~~

~~d. Emergency Diesel Generator~~

~~Emergency electrical power in the event of a power outage at Puunene Mill is provided by a Cummins Model NT8556 Diesel-fueled emergency generator. This four-stroke, turbocharged internal combustion engine has a maximum rated capacity of 355 HP at 1800 RPM. Under normal conditions, the emergency generator is operated approximately one hour per month (12 hours per year) for testing purposes.~~

~~e. Secondary Fire Pump~~

~~The Puunene Mill's secondary (backup) fire pump is powered by 280 HP Cummins engine, Model NT855FI. Under normal conditions, this four-stroke, turbocharged engine is operated only one hour per month for testing purposes.~~

Changes from the original CSP application: These items have been moved to the section on insignificant sources (see Section f below).

b. Specialty Sugar Dryer (New Section)

To improve the quality of specialty sugar products (Premium Turbinado), a rotary dryer and cooler system are used upstream of the sugar packaging plant. The stainless steel rotary dryer is 30 feet long and five feet in diameter, and is equipped with an Entoleter Model 0405 wet scrubber to recover sugar dust entrained in the dryer air flow. The dry sugar exits the dryer and enters the cooling tray, where ambient air is blown across the dry sugar to cool it prior to packaging. The exhaust from the cooler is routed to the wet scrubber. In the wet scrubber, the air streams pass through water sprays, which remove most of the particulate matter entrained in the air. The scrubbed air is routed via an induced draft fan to a 50-foot exhaust stack.

12

Changes from the original CSP application:

1. Installation and operation of food grade sugar dryer approved as minor modification. (Ref: HDOH letter dated February 7. 2000)
2. Increase in annual throughput limit to 75,000 tons per year approved as minor modification. (Ref: HDOH letter dated August 11, 2003)

c. Fuel Storage Tanks and Liquid Fuel Dispensers (Section I.C.3.f of original application)

Liquid fuels for the boilers and plant mobile equipment are stored in above ground storage tanks on the factory grounds. The tanks range in size from 250 to 25,000 gallon capacity, and contain a variety of fuels, including propane, Diesel, specification used oil and gasoline. Lubricants, hydraulic fluids, and other petroleum products are also stored in tanks of various sizes. The capacities and contents of these tanks are shown in Table A-1R[1]; tank locations are shown in Figures A-1R and A-2R[1].

There are also several fuel dispensers used for fueling plant vehicles. The gasoline dispensers are located adjacent to the eastern end of Tank PU-31 (see Figure A-2R), and consist of two Gasboy[1] dispensers with two hoses and nozzles each. One Gasboy ultra-low sulfur[1] (on-road) Diesel dispenser is adjacent to Tank PU-41. This dispensing station is equipped with two 1-inch hoses and nozzles. Two Gasboy off-road Diesel dispensing stations are located southeast of the cane hauler shop. Each station is equipped with two 2-inch diameter hoses and OPW nozzles.

Changes from the original CSP application:

1. The description and locations of the tanks and dispensers were revised to correspond to the facility's 1995 Spill Prevention Control and Countermeasure Plan. Revised versions of Table A-1 and Figure A-1 were provided at that time. (Ref: HC&S letter dated December 19, 1995). Since then, HC&S has upgraded, removed from service, or replaced various tank systems. Newly revised versions of Table A-1 and Figures A-1 and A-2 are therefore enclosed with this application.

d. Fuel and Material Storage Piles (Section I.C.3.g of original application)

The primary fuel for the steam boiler at the factory is bagasse. Bagasse is generally stored in the bagasse house, but when the supply exceeds the bagasse house capacity, excess bagasse is piled in any of three storage areas located behind the mill (see Figure 3) to a height not to exceed ~~15~~ 20 feet.[1]

The washed, low-sulfur coal that is used as a backup fuel for the steam boilers is stored in any of the three storage areas until needed at the coal supply pile. Coal is moved from the 20-foot high piles in the storage areas to the supply pile by truck. The coal supply pile is approximately 100 feet by 250 feet in size, with a maximum height of approximately 20 feet.[1] Coal in the storage and supply piles may be[2] washed to minimize the formation of fugitive dust, and maintains a moisture content of approximately 8 percent. Coal from the supply pile is fed directly into the boiler via a conveyor system.

Changes from the original CSP application:

1. The description of the solid fuel storage areas was amended to indicate that either bagasse or coal could be stored in any of the three storage areas, and that the height of any pile could be as high as 20 feet. (Ref: HC&S letter dated December 22, 1995)
2. The original permits that allowed coal firing in the HC&S boilers allow the receipt and burning of unwashed coal as long as HDOH is notified prior to receipt of such coal and a Fugitive Emissions Control Plan is submitted and complied with. The original CSP application erroneously indicated that only washed coal would be used in the boilers. This was corrected in a follow-up letter which clarified that the provisions of the existing permits allowing the use of unwashed coal should be retained. (Ref: HC&S letter dated August 28, 1997)

e. Emission Control Systems (New Section)[1]

The boilers are each equipped with multiclones, and the exhaust stacks[2] are equipped with venturi wet scrubbers for particulate control. The Boilers 1 and 2 wet scrubber, which is a recirculating system, exhausts through a 154-foot tall stack. The Boiler 3 wet scrubber, which can be used in either a once-through or a recirculating configuration, exhausts through a 140-foot stack.

Changes from the original CSP application:

1. The original CSP did not provide detailed information regarding the design of the wet scrubbers and multiclones. At the time the application was filed, the wet scrubber for Boilers 1 and 2 was a recirculating system while the Boiler 3 wet scrubber was a once-through system. HC&S requested and received approval for a two-phased approach to reducing the quantity of wastewater generated by the Boiler 3 wet scrubber by modifying the inlet design and installing supplemental internal components (Phase I) and converting the scrubber from a once-through water use system to a recirculating system (Phase II). (Ref: HC&S letters dated December 9, 2002, August 15, 2003, and November 21, 2003; HDOH letters dated January 10, 2003, and December 18, 2003)
2. The original CSP incorporated by reference information regarding the stack configuration for the boilers. At the time the original CSP application was submitted, the Boiler 3 stack was 120 feet tall. The stack height was subsequently increased to 140 feet. (Ref: HC&S letter dated August 30, 2004; HDOH letter dated October 26, 2004)

f. Additional Insignificant Activities (Section I.C.3.h of original application)

The insignificant activities discussed in sections I.C.3.b, c, d, e, f and h of the original CSP have been augmented or superseded by a revised list that was prepared in accordance with the revisions to HAR 11-60.1 in 2001. Additional changes to insignificant activity provisions were made when HAR 11-60.1 was again revised in 2003. The following new Tables 4a and 4b reflect the latest revisions to the insignificant sources at Puunene.

Table 4a: Insignificant Activities at HC&S Puunene Mill (New) (Required to be Listed in Covered Source Permit Application)	
Equipment or Activity Listed	**Applicable Section**
Various petroleum storage tanks of less than 42,000-gallon capacity	11-60.1-82(f)(1)
Landa diesel-fired pressure washer (558 MBtu/hr), Tractor Shed[1]	11-60.1-82(f)(2)
RECO propane-fired water heater at HARC Experiment Station (505 MBtu/hr)[2]	11-60.1-82(f)(3)
BAYCO propane-fired heat cleaning oven (625 MBtu/hr), Motor Shop[3]	11-60.1-82(f)(7)
355 HP Emergency Diesel Generator	11-60.1-82(f)(5)
Lime slaker and storage bin[4]	11-60.1-82(f)(7)
Wood-fired refractory curing within boilers[5]	11-60.1-82(f)(7)
Various welding booths in Mill Industrial Shops (five or more)	11-60.1-82(g)(1)
63 HP portable diesel-fired air compressor, Construction Shop	11-60.1-82(f)(2)
80 HP portable diesel-fired air compressor, Construction Shop	11-60.1-82(f)(2)
22 HP portable diesel-fired pressure washer, Tractor Shop	11-60.1-82(f)(2)
Various portable gasoline-fired welding machines, generators , pumps, pressure washers, and other equipment less than 25 HP used for maintenance and repair	11-60.1-82(g)(8)
Temporary Diesel generators operated during annual facility power outage for maintenance[6]	11-60.1-82(f)(7)
40 HP Jet-Crete portable gasoline-fired gunite machine, Construction Shop[7]	11-60.1-82(g)(9)
Various portable diesel-fired welding machines, electric generators, air compressors, and other industrial equipment less than 143 HP used for maintenance and repair[7]	11-60.1-82(f)(2)
280 HP diesel-fired secondary fire pump[8]	11-60.1-82(g)(6)
Solvent cleaning and degreasing[8]	11-60.1-82(f)(7)
Electrical varnish dip tank[8]	11-60.1-82 (f)(1)
Mixing of powdered herbicides[8]	11-60.1-82 (f)(7)
Painting, woodworking, sandblasting operations[8]	11-60.1-82 (g)(9) and (g)(14)
Seed treatment dip tanks[8]	11-60.1-82 (f)(7)
Bagacillio collection and transfer system[9]	11-60.1-82(f)(7)
Plant maintenance and upkeep activities[10]	11-60.1-82(g)(9)

Table 4b: Appliances Containing More Than 50 Pounds of Class I or Class II Ozone Depleting Substance at Puunene Mill[11] (new)			
Equipment Description	**Serial Number**	**Location**	**Nominal CFC Charge**
GE VaporTran Electrical Transformer	M125237	Cane Cleaner	1,640 pounds CFC-113
GE VaporTran Electrical Transformer	M125238	Cane Cleaner	1,640 pounds CFC-113
GE VaporTran Electrical Transformer	M125239	Cane Cleaner	1,140 pounds CFC-113
GE VaporTran Electrical Transformer	M12540	High Grade Substation	1,140 pounds CFC-113
GE VaporTran Electrical Transformer	M125241	Mill Substation	1,140 pounds CFC-113
GE VaporTran Electrical Transformer	M125242	Cane Cleaner	1,140 pounds CFC-113
GE VaporTran Electrical Transformer	L245688	Unloading Crane	1,010 pounds CFC-113
GE VaporTran Electrical Transformer	M126153	Mill Substation	1,010 pounds CFC-113
GE VaporTran Electrical Transformer	M125243	Power House	1,080 pounds CFC-113
GE VaporTran Electrical Transformer	M125244	Power House	1,080 pounds CFC-113
GE VaporTran Electrical Transformer	M125245	Power House	1,080 pounds CFC-113
GE VaporTran Electrical Transformer	M126277	Mill Substation	1,010 pounds CFC-113
Carrier Weathermaker Air Conditioner[7]	3290F29090	Main Office, east wing	150 pounds R-22
Carrier Air Conditioner, 15-ton capacity[7]	733677	Main Office, Industrial Relations Dept.	50-100 pounds R-22
Carrier Air Conditioner, 10-ton capacity[7]	3200G04124	Power Plant, TG-4	50-100 pounds R-22
(Additional units currently installed at Paia Mill that may eventually be installed at Puunene mill)			
GE VaporTran Electrical Transformer	L245722		1,010 pounds CFC-113
GE VaporTran Electrical Transformer	M125248		1,080 pounds CFC-113
GE VaporTran Electrical Transformer	L245689		1,010 pounds CFC-113

Changes since the original CSP application:

1. This unit replaced the Hotsy pressure washer described in section I.C.3.c of the original permit application, which is no longer in service. (Ref HC&S letter dated September 1, 1999)
2. This unit replaced the Bock diesel-fired water heater added to the permit in 1996, which is no longer in service. (Ref HC&S letters dated March 5, 1996 and April 20, 2004)
3. This unit was described in section I.C.3.b of the original permit application, and was subsequently determined by DOH to be an insignificant activity. (Ref: HDOH letter dated May 24, 1995)
4. This unit was determined to be an insignificant activity. (Ref. HDOH letter dated April 4, 1997)
5. This activity was determined to be an insignificant activity at the Paia Mill; refractory curing conducted at Puunene is identical to that at Paia. (Ref. HDOH letter dated May 4, 2001, CSP 0053-01)

6. The operation of diesel generators during the annual off-season power outage was determined to be an insignificant activity. (Ref. HDOH letter dated December 20, 2001)
7. (Ref. HDOH letter dated December 20, 2001)
8. These activities were listed and described in Section I.C.3.h of the original CSP application as insignificant activities.
9. The bagacillio system provides fine bagasse (bagacillio) to the mud filters in the boiling house. This system collects fine bagasse from the bagasse house (via a blower and ducting) and routes it through a cyclone that deposits the bagacillio onto a screw conveyor for use as a filter medium. The cyclone exhausts to a stack in the wall of the boiling house. The stack is equipped with a rain hat so that any emitted dust would be directed downward. There is no visible dust being emitted from the stack and no bagasse accumulated around the stack, indicating that emissions are insignificant.
10. These cleaning activities are not conducted as part of a manufacturing process, are not related to the primary business activity, and are not otherwise subject to applicable requirements.
11. (Ref. HC&S letter dated November 30, 2001)

Table A-1R and Figures A-1R and A-2R

Locations and Descriptions of Fuel Storage Tanks and Dispensers

Table A-1R

Tank #	Capacity	Storage	Location	Notes
PUUNENE MILL FUEL & LUBRICANT TANKS				
PU 4	372 gal	Diesel Fuel	Power Plant Substation [adjacent to]	Emergency generator fuel tank
PU 20	372 gal	Diesel Oil #2	Lime Silo [adjacent to]	Secondary Fire Pump fuel tank
PU 31	6,000 gal	Gasoline	Cane Hauler Shop [northeast of]	Piped to dispenser
PU 38	12,000 gal	Diesel fuel off-road	Hauler Shop [East of]	Piped to dispensing tanks
PU 39	6,000 gal	Diesel fuel off-road	Hauler Shop [East of]	Piped to dispenser
PU 40	6,000 gal	Diesel fuel off-road	Hauler Shop [East of]	Piped to dispenser
PU 41	6,000 gal	Diesel Fuel on-road	Hauler Shop [North of]	Piped to dispenser
PU 47	600 gal	Grease	Mill Sugar Room [near / inside]	red portable tank
PU 50	500 gal	Motor oil	Machine Shop [outside / near cane cleaner]	Portable tank piped for dispensing to harvesting crane at unloading station
PU 51	500 gal	Lubricants	Mill Oil Room [storage racks inside]	Portable Tank
PU 52	500 gal	Lubricants	Mill Oil Room [storage racks inside]	Portable Tank

Tank #	Capacity	Storage	Location	Notes
PU 53	500 gal	Lubricants	Mill Oil Room [storage racks inside]	Portable Tank
PU 54	500 gal	Lubricants	Mill Oil Room [storage racks inside]	Portable Tank
PU 55	500 gal	Lubricants	Mill Oil Room [storage racks inside]	Portable Tank
PU 56	500 gal	Lubricants	Mill Oil Room [storage racks inside]	Portable Tank
PU 57	500 gal	Lubricants	Mill Oil Room [storage racks inside]	Portable Tank
PU 58	500 gal	Lubricants	Mill Oil Room [storage racks inside]	Portable Tank
PU 59	500 gal	Lubricants	Mill Oil Room [storage racks inside]	Portable Tank -
PU 60	500 gal	Lubricants	Mill Oil Room [storage racks inside]	Portable Tank
PU 62	500 gal	Grease	Mill Oil Room [inside]	Portable cone-bottom tank for grease dispensing
PU 63	500 gal	Grease	Mill Oil Room [inside]	Portable cone-bottom tank for grease dispensing
PU 64	250 gal	Empty	Mill Oil Room [inside]	Portable tank, not in service
PU 65	500 gal	Engine, Hydraulic Oils	Hauler Shop	Portable Tank
PU 66	500 gal	Engine, Hydraulic Oils	Hauler Shop	Portable Tank

Tank #	Capacity	Storage	Location	Notes
PU 67	250 gal	Various Lubricants	Hauler Shop	Portable Tank
PU 68	250 gal	Grease	Hauler Shop	Portable Tank
PU 74	500 gal	Various Lube and Hydraulic Oils	Tractor Shed	Portable Tank
PU 75	500 gal	Various Lube and Hydraulic Oils	Tractor Shed	Portable Tank
PU 76	500 gal	Various Lube and Hydraulic Oils	Tractor Shed	Portable Tank
PU 77	500 gal	Various Lube and Hydraulic Oils	Tractor Shed	Portable Tank
PU 78	500 gal	Grease	Tractor Shed	Portable Tank
PU 79	500 gal	Various Lube and Hydraulic Oils	Auto Maintenance [inside shop]	Portable Tank
PU 80	500 gal	Various Lube and Hydraulic Oils	Auto Maintenance [inside shop]	Portable Tank
PU 81	500 gal	Various Lube and Hydraulic Oils	Auto Maintenance [inside shop]	Portable Tank
PU 82	250 gal	Various Lube and Hydraulic Oils	Auto Maintenance [inside shop]	Portable Tank
PU 83	250 gal	Various Lube and Hydraulic Oils	Auto Maintenance [inside shop]	Portable Tank
PU 84	500 gal	Grease	Auto Maintenance [inside shop]	Portable tank

Tank #	Capacity	Storage	Location	Notes
PU 85	500 gal	Hydraulic Oil	Machine Shop [outside near cane cleaner]	Portable tank piped for dispensing to harvesting crane at unloading station
PU 86	500 gal	Diesel fuel	outside Machine Shop near cane cleaner	Portable tank pipe for dispensing to harvesting crane at unloading station
PU 87	500 gal	Various Lube and Hydraulic Oils	Tractor Shed	Portable Tank
PU 88	500 gal	Various Lube and Hydraulic Oils	Tractor Shed	Portable Tank
PU 89	500 gal	Various Lube and Hydraulic Oils	Tractor Shed	Portable Tank
PU 90	500 gal	Various Lube and Hydraulic Oils	Tractor Shed	Portable Tank
PU 94	2,150 gal	Turbine Oil	TG-4 [basement]	Operational equipment supplies lubricating oil to TG-4;
PU 95	2,900 gal	Turbine Oil	Power House [basement]	Supplies lubricating oil to TG-5;
PU 96	3,500 gal	Oily Water	Maui Brand Warehouse [adjacent to]	Operational equipment for processing oily water
PU 97	100 gal	Oily Water	Maui Brand Warehouse [adjacent to]]	Oil/water separator with coalescing plates Operational equipment for processing oily water
PU 98	86 gal	Hydraulic Oil	TG-4 [basement]	Operational equipment supplies hydraulic oil to TG-4
PU 99	1,400 gal	Turbine Oil	TG-3 [turbine end of]	Operational equipment supplies lubricating oil to TG-3
PU 101A	25,000 gal	Diesel Fuel Spec Oil	Tank Farm [southwest of main office]	Piped to Boiler 3

Tank #	Capacity	Storage	Location	Notes
PU 101B	17,500 gal	Diesel Fuel Spec Oil	Tank Farm [southwest of main office]	Piped to Boiler 3
PU 101C	17,500 gal	Diesel Fuel Spec Oil	Tank Farm [southwest of main office]	Piped to Boiler 3
PU 102A	25,000 gal	Spec Oil Diesel Fuel	Tank Farm [southwest of main office]	Piped to Boilers 1&2;
PU 102B	17,500 gal	Spec Oil Diesel Fuel	Tank Farm [southwest of main office]	Piped to Boilers 1&2;
PU 102C	17,500 gal	Spec Oil Diesel Fuel	Tank Farm [southwest of main office]	Piped to Boilers 1&2;
PU 103A	25,000 gal	Spec Oil Diesel Fuel	Tank Farm [southwest of main office]	Piped to Boilers 1&2;
PU 103B	17,500 gal	Spec Oil Diesel Fuel	Tank Farm [southwest of main office]	Piped to Boilers 1&2;
PU 103C	17,500 gal	Spec Oil Diesel Fuel	Tank Farm [southwest of main office]	Piped to Boilers 1&2;
PU 110	100 gal	Hydraulic Oil	Oil Room [hydraulic power pack 7244]	Operational equipment supplies hydraulic oil to mill equipment -
PU 111	100 gal	Hydraulic Oil	Oil Room [hydraulic power pack]	Operational equipment supplies hydraulic oil to mill equipment -
PU 112	280 gal	Hydraulic Oil	Oil Room	Operational equipment supplies hydraulic oil to mill equipment -
PU 113	170 gal	Hydraulic Oil	Oil Room [hydraulic power pack]	Operational equipment supplies hydraulic oil to mill equipment -
PU 114	125 gal	Hydraulic Oil	Oil Room [hydraulic power pack]	Operational equipment supplies hydraulic oil to mill equipment -

Tank #	Capacity	Storage	Location	Notes
PU 115	100 gal	Hydraulic Oil	Oil Room [hydraulic power pack 7225]	Operational equipment supplies hydraulic oil to mill equipment -
PU 116	175 gal	Hydraulic Oil	Oil Room [hydraulic power pack 7223]	Operational equipment supplies hydraulic oil to mill equipment -
PU 117	125 gal	Hydraulic oil	Cane Cleaner [hydraulic power pack]	Operational equipment supplies hydraulic oil to mill equipment -
USED OIL TANKS				
PU 72	425 gal	Used Oil	Transportation Yard [Puunene service rack]	Portable Tank
PU 73	425 gal	Used Oil	Transportation Yard [Puunene service rack]	Portable Tank
PU 272-2	425 gal	Used Oil	Outside Mill oil room - varies	sloped bottom 125 gallons
PU 272-3	600 gal	Used Oil / Water	Mill oil room – blow down tank	sloped bottom 125 gallons
PU 272-4	550 gal	Used Oil	Outside Mill oil room - varies	sloped bottom 125 gallons
PU 272-5	600 gal	Used Oil	Outside Mill oil room - varies	sloped bottom 125 gallons
PU 313-1	600 gal.	Used Oil	Power Plant	sloped bottom 125 gallons – periodic use only
PU 315-1	425 gal	Used Oil	Electric Shop	sloped bottom 50 gallons – periodic use only
PU 323-1	600 gal	Used Oil	Tractor Shed	sloped bottom 125 gallons
PU 323-2	600 gal	Used Oil	Tractor Shed	sloped bottom 125 gallons
PU 323-4	600 gal	Used Oil	Auto Maintenance	sloped bottom 125 gallons
PU 361-1	288 gal	Used Oil	Tractor Shop	Portable Tank

Tank #	Capacity	Storage	Location	Notes
PU 361-2	288 gal	Used Oil	Tractor Shop	Portable Tank
PU 362-2	425 gal	Used Oil	Hauler Shop	sloped bottom; former PU34
PU 362-3	425 gal	Used Oil	Hauler Shop	sloped bottom; former PU32
PU 363-1	288 gal	Used Oil	Tractor Shop	Portable Tank
PU 364-2	288 gal	Used Oil	Auto Maintenance	Portable Tank
PU 364-3	288 gal	Used Oil	Auto Maintenance	Portable Tank
PU 364-4	288 gal	Used Oil	Service Rack	Portable Tank
PU 364-4	288 gal	Used Oil	Seed Plant	Portable Tank
PU 365-1	288 gal	Used Oil	Tractor Shed	Portable Tank
PU 419-1	137 gal	Used Oil	Drum Storage Area #1	Portable Tank
PU 419-2	137 gal	Used Oil	Drum Storage Area #1	Portable Tank
PU 419-3	300 gal	Used Oil	Drum Storage Area #1	Portable Tank
PU 419-4	425 gal	Used Oil	Drum Storage Area #1	sloped bottom 125 gallons
PU 419-5	425 gal	Used Oil	Drum Storage Area #1	sloped bottom 125 gallons
PU 419-6	600 gal	Used Oil	Drum Storage Area #1	sloped bottom 125 gallons
PU 619-1	600 gal.	Used Oil	General use – location varies	sloped bottom 125 gallons
PU 619-2	425 gal.	Used Oil	General use - varies	sloped bottom 125 gallons
PU 619-3	425 gal.	Used Oil	General use - varies	sloped bottom 125 gallons

Tank #	Capacity	Storage	Location	Notes
PU 619-4	425 gal.	Used Oil	General use - varies	sloped bottom 125 gallons
PU 619-5	425 gal.	Used Oil	General use - varies	sloped bottom 125 gallons
PU 619-6	425 gal.	Used Oil	General use - varies	sloped bottom 125 gallons
PU 619-7	550 gal.	Used Oil	General use - varies	sloped bottom 125 gallons
PU 619-8	425 gal.	Used Oil	General use - varies	sloped bottom 125 gallons
PROPANE TANKS				
PU 1000	1,000 gal.	Propane	Adjacent to bagasse house	
PU 1001	400 gal.	Propane	Hauler Shop	
PU 1002	1,000 gal	Propane	Motor Shop	
PU 1003	500 gal	Propane	HARC Experiment Station	

27

Figure A-1R

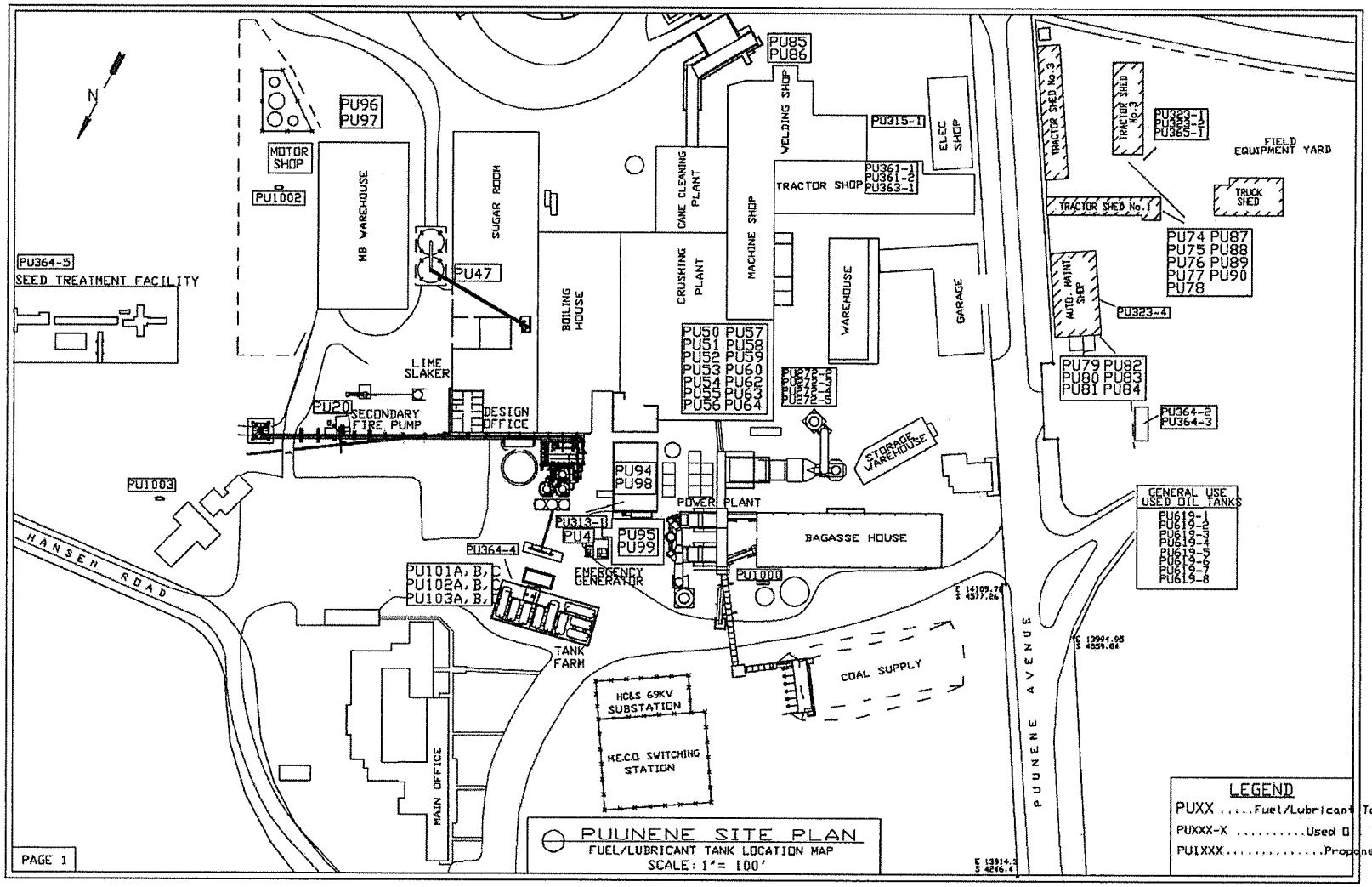
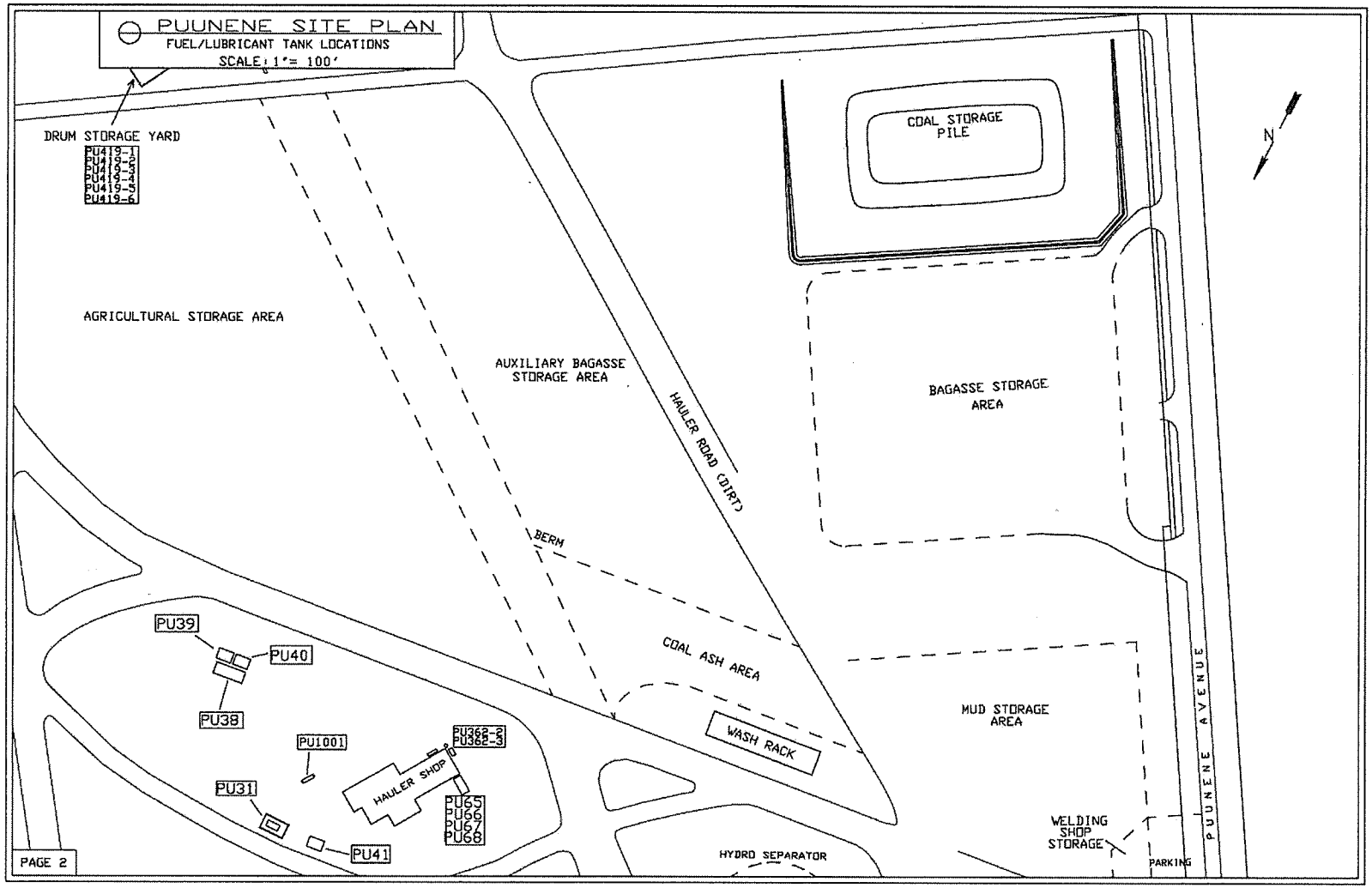

N
PU96
PU97
MOTOR SHOP
PU1002
MB WAREHOUSE
SUGAR ROOM
PU47
BOILING HOUSE
CANE CLEANING PLANT
CRUSHING PLANT
MACHINE SHOP
WELDING SHOP
PU315-1
ELEC SHOP
TRACTOR SHOP
PU361-1
PU361-2
PU363-1
WAREHOUSE
GARAGE
PU85
PU86
PU364-5
SEED TREATMENT FACILITY
LIME SLAKER
PU20
SECONDARY FIRE PUMP
DESIGN OFFICE
PU50 PU57
PU51 PU58
PU52 PU59
PU53 PU60
PU54 PU62
PU55 PU63
PU56 PU64
PU278-3
PU278-4
PU278-5
PU278-6
STORAGE WAREHOUSE
PU1003
PU94
PU98
POWER PLANT
PU313-1
PU4
PU95
PU99
BAGASSE HOUSE
PU364-4
PU101A, B, C
PU102A, B, C
PU103A, B, C
EMERGENCY GENERATOR
PU1000
HANSEN ROAD
TANK FARM
COAL SUPPLY
HC&S 69KV SUBSTATION
HE.C.O. SWITCHING STATION
MAIN OFFICE
PUUNENE AVENUE
TRACTOR SHED No.3
TRACTOR SHED No.2
PU323-1
PU323-2
PU365-1
FIELD EQUIPMENT YARD
TRACTOR SHED No.1
TRUCK SHED
PU74 PU87
PU75 PU88
PU76 PU89
PU77 PU90
PU78
AUTO. MAINT. SHOP
PU323-4
PU79 PU82
PU80 PU83
PU81 PU84
PU364-2
PU364-3
GENERAL USE USED OIL TANKS
PU619-1
PU619-2
PU619-3
PU619-4
PU619-5
PU619-6
PU619-7
PU619-8
LEGEND
PUXX .....Fuel/Lubricant Tank
PUXXX-X .....Used Oil Tank
PUIXXX.....Propane Tank
PAGE 1
PUUNENE SITE PLAN
FUEL/LUBRICANT TANK LOCATION MAP
SCALE: 1"= 100'

Figure A-2R


PUUNENE SITE PLAN
FUEL/LUBRICANT TANK LOCATIONS
SCALE: 1"= 100'
DRUM STORAGE YARD
PU419-1
PU419-2
PU419-3
PU419-4
PU419-5
PU419-6
AGRICULTURAL STORAGE AREA
AUXILIARY BAGASSE STORAGE AREA
HAULER ROAD (DIRT)
COAL STORAGE PILE
BAGASSE STORAGE AREA
N
BERM
COAL ASH AREA
WASH RACK
MUD STORAGE AREA
PUUNENE AVENUE
PU39
PU40
PU38
PU1001
PU362-2
PU362-3
HAULER SHOP
PU31
PU65
PU66
PU67
PU68
PU41
HYDRD SEPARATOR
WELDING SHOP STORAGE
PARKING
PAGE 2

Attachment 3
Proposed Modifications

As part of this consolidated revised covered source permit application, HC&S is proposing several additional changes, not previously requested, to fuels and equipment at the Puunene mill. These proposed changes are as follows:

Eliminate Use of #6 Fuel Oil in All Boilers

HC&S is proposing to eliminate the use of #6 fuel oil at Puunene Mill. This will reduce emissions of criteria pollutants from Boilers 1 and 2 during oil firing, as #6 fuel oil has higher emission rates per million Btu of oil fired than #2 fuel oil or specification used oil, the other oil fuels that are currently permitted for use in Boilers 1 and 2 and that will be used in place of #6 fuel oil. This will also reduce the SO_2 potential to emit for Boilers 1 and 2, and therefore the potential ambient SO_2 impacts from the Puunene mill. The ambient air quality impact analysis presented in Attachment 6 reflects this change.

HC&S is already prohibited from firing high sulfur fuel oil (HSFO) alone in Boiler 3 under 40 CFR Part 60, Subpart D; however, HC&S has previously indicated that we desired to preserve the ability to fire HSFO in combination with other, lower sulfur fuels in Boiler 3. Because HC&S has repeatedly demonstrated through stack testing that emissions of oxides of nitrogen from Boiler 3 are less than 70% of the applicable NSPS limit during coal and distillate oil firing, we believe that the firing of HSFO in combination with other fuels is the only operating scenario under which a CEMS for oxides of nitrogen would be required under Subpart D. By eliminating #6 fuel oil as an allowable fuel in Boiler 3 as well as in Boilers 1 and 2, we believe that installation of a CEMS for monitoring emissions of NOx from Boiler 3 is not required per 40 CFR §60.45(b)(3).

Implement Phase I of the SEP: Alternate Monitoring of Opacity for Boilers 1 and 2

On December 20, 2006, Hawaiian Commercial & Sugar Company, Inc. (HC&S) and the State of Hawaii, Department of Health (HDOH) signed a consent order to settle and resolve alleged violations of state regulations related to 40 CFR Part 60, Subpart D. As part of the consent order, HC&S agreed to undertake a two-phase Supplemental Environmental Project (SEP). The first phase of the SEP requires HC&S to implement alternative opacity monitoring for Boilers 1 and 2, as described in Exhibit A to the consent order. Under the terms of the consent order, the SEP must be undertaken within 180 days of the effective date of the order, or by June 8, 2007. Any permit applications or revisions related to the consent order must be submitted within 120 days of the effective date of the order, or by April 7, 2007, and HC&S must secure all required operating permits.

The attached *Procedure for Meeting Alternative Opacity Monitoring, Notification, and Recordkeeping Requirements – Puunene Boilers 1, 2, and 3* (Attachment 7) is being submitted as part of this permit application to meet the requirements contained in Exhibits A, C, D, and E of the consent order, and to consolidate and make consistent alternate opacity monitoring requirements for all three boilers. Note that HC&S could be required to implement wet scrubber monitoring and control procedures under 40 CFR Part 63, Subpart DDDDD in the event that compliance with Subpart DDDDD emission limits cannot be demonstrated by fuel testing. In that event, HC&S will, within 120 days of making such determination, propose for DOH approval an additional SEP of equal or greater value to Phase I of the SEP. In addition, HC&S shall modify the attached procedure as necessary for compliance with applicable requirements of Subpart DDDDD.

Implement Phase II of the SEP: Improved Bagasse Delivery System for Puunene Boilers

The second phase of the SEP requires HC&S to install an improved bagasse delivery system for the Puunene boilers, as described in Exhibit B to the consent order. Since the bagasse delivery system improvements do not constitute a modification under state and federal regulations, no covered source permit (CSP) application is required for this project. The reasons for this conclusion are outlined below.

1. Improvements to the Bagasse Delivery System Are Not a Major Modification

State regulation defines "modification" as

> "...a physical change or a change in the method of operation of a stationary source which requires a change to a permit." [H.A.R. §11-60.1-81]

Federal regulation defines "modification" as

> "...any physical change in or change in the method of operation of a major stationary source that would result in: a significant emissions increase (as defined in paragraph (b)(40) of this section) of a regulated NSR pollutant (as defined in paragraph (b)(50) of this section); and a significant net emissions increase of that pollutant from the major stationary source." [40 CFR 52.21(b)(2)]

The regulations define "stationary source" as

> "...any building, structure, facility, or installation which emits or may emit a regulated NSR pollutant." [40 CFR 52.21(b)(5)]

The bagasse delivery system is part of the stationary source that includes the boilers, and therefore this assessment must consider whether (a) the proposed physical change would result in a significant emissions increase, and (b) the proposed physical change would require a change to a permit.

a. The proposed improvements would not result in a significant emissions increase.

This issue is addressed directly in the description of the improved bagasse delivery system in Exhibit B to the consent order:

> "The proposed upgrades will impact *only the system for delivering bagasse to the boiler feeders* (i.e., from the conveyor system up to the chutes through which bagasse enters the feeders). *No changes will be made to the bagasse feeders to deliver fuel into the boilers.*" [emphasis added]

The proposed upgrades also will not affect the boilers themselves. The proposed upgrades will not affect the operation of the boilers or of the bagasse feeders that actually deliver fuel to the boilers, so they will not result in any increase in short-term emissions from the stationary source.

As further discussed in the consent order,

> "The objective of the upgrades is to minimize impacts on boiler operations due to wet bagasse coming from the mill, thereby reducing boiler upsets and the associated transient increase in visible emissions...When necessary, operators will be able to switch fuels in a controlled and orderly manner, with lower resulting emissions, rather than having to quickly react to a loss of fuel input or other boiler upset."

Because the boilers operate on a variety of fuels (coal, bagasse, and fuel oil, among others), boiler upsets during bagasse firing under the current delivery system design result in a changeover to another available fuel, such as coal or fuel oil. The improvement in operating reliability on bagasse that is the objective of the proposed upgrades will not eliminate boiler downtime but instead will eliminate the need to burn other fuels and minimize boiler upsets. Therefore the proposed upgrades will not result in increased annual boiler operations or emissions.

b. <u>The proposed improvements would not require a change to a permit.</u>

The design and operation of the bagasse delivery system are not addressed in the existing permits to operate for the boilers. Therefore, the proposed improvements will not contravene any permit condition or any information relied upon in issuing the existing permits, and no changes to the permits are necessary before the improvements can be made.

2. Improvements to the Bagasse Delivery System Do Not Constitute Debottlenecking

Even if an alteration of a piece of equipment is not considered a modification of that piece of equipment under the regulations, if the proposed alteration affects emissions from an upstream or downstream emissions unit the alteration may be considered "debottlenecking." Under federal regulations, increases in emissions from a debottlenecked unit may be considered a modification to that unit. EPA provided a discussion of this issue in a recent rulemaking.[1]

> "A major stationary source often consists of multiple emitting and non-emitting units that comprise integrated processes at the source. As part of the operations of the source or within a process, various pieces of equipment may provide input to or accept output from other equipment or units at the source. These equipment and units at the source may have different operating capacities.
>
> When equipment and units of different capacities operate, one unit may constrain other units from operating at their full design capacity or maximum output rating either by limiting inputs to those other units or by limiting usable output. Such constraining equipment and units are commonly called 'bottlenecks' in a process. The constrained emissions unit(s) can be situated in the process either in advance of the constraining emissions unit (i.e., 'upstream') or after it ('downstream').
>
> When a constraining unit or piece of equipment is changed to increase its capacity, another unit may increase its operations (depending on whether some or all of the constraint was removed) to provide input to the changed unit or use

[1] Federal Register: September 14, 2006 (Volume 71, Number 178) Page 54235-54252.

output from it. We have historically referred to this phenomenon as 'debottlenecking.' This increased operation of the upstream or downstream emissions unit(s) can contribute to increased emissions from the unit(s).

Our current regulations define a 'major modification' as one in which a physical change or a change in the method of operation of a major stationary source results in a significant emissions increase of a regulated NSR pollutant and a significant net emissions increase of that pollutant at the source. See 40 CFR 52.21(b)(2). Based on this current regulation, the total increase in emissions that are included in determining if there will be a post-change significant emissions increase includes: (1) Increases occurring at all new or modified units, and (2) any other increases at existing emissions units not being modified that experience emissions increases as a result of the change."

Therefore, the proposed upgrades to the bagasse delivery system must also be evaluated to determine whether they will allow the downstream equipment, the bagasse feeders, or the boilers themselves, to increase operations in a manner that could affect emissions.

This issue is addressed directly in the description of the improved bagasse delivery system in Exhibit B to the consent order:

> "The proposed upgrades will impact *only the system for delivering bagasse to the boiler feeders* (i.e., from the conveyor system up to the chutes through which bagasse enters the feeders). *No changes will be made to the bagasse feeders to deliver fuel into the boilers.* ***The rated capacity of the boilers and bagasse feeders will not be changed.***" [emphasis added]

The rated capacities of the boilers and bagasse feeders will not be affected by the bagasse delivery system upgrades. In addition, the improvements in the reliability of the bagasse conveyor system will not affect the rated capacity or throughput of the conveyors, feeders, or boilers. Consequently, the upgrades are not considered to debottleneck the emission units.

For these reasons, we believe that the implementation of Phase II of the SEP is not a modification under state or federal regulations, and therefore does not need to be specifically addressed in the permit application. HC&S is currently in the process of engineering the improvements to the bagasse delivery system and will keep the Department apprised of progress on this phase of the SEP, including any design changes, through its quarterly compliance updates.

Changes Related to Specification Used Oil Use

a. Update description of specification used oil storage and handling procedures (Section I.D.2.a of the original CSP application)

Currently, specification used oil is handled in accordance with the HC&S Standard Operating Procedures for Used Oil Management that was included as Appendix B to the original CSP application. ~~All specification used oil from HC&S's Puunene mill is transported to the Paia mill in portable tanks for burning in the Paia boiler.~~[1]

~~HC&S proposes to install a new specification used oil fuel tank farm at Puunene along with piping to deliver the fuel directly to the boilers there, and to begin burning specification used oil in the boilers at Puunene as well in quantities not to exceed 5% of~~

~~total fuel oil burned at the mill on an annual basis.~~[2] ~~In addition, the existing portable specification used oil storage tanks will be replaced with new 500-gallon storage tanks.~~[1] HC&S will accept specification used oil from outside sources, such as local used oil recycling companies, at the Puunene Mill, as long as a laboratory analysis of each oil shipment is provided demonstrating that the used oil meets the specifications shown in Table 4R. Recordkeeping, reporting, and actions taken in the event that used oil is found to exceed specifications are described in Appendix B to the original CSP. In addition, HC&S will submit to the Department the required annual reports, including reports of annual emissions, annual specification used oil usage (including an indication of whether the oil was generated on site or obtained from other sources) and any exceedance of specifications.

Table 4R

Specifications for Used Oil Fuel

Parameter	Specification
Arsenic	5 ppm max.
Cadmium	2 ppm max.
Chromium	10 ppm max.
Lead	100 ppm max.
Total halogens	1000 ppm max.
Sulfur	0.75 % by weight max. (Boilers 1 and 2) 0.5% by weight max (Boiler 3)[2]
Flash point	100°F min.
PCBs	2 ppm max.

Changes since the original CSP application:

1. The Paia Mill is shut down, so specification used oil collected at Puunene Mill is not transported to Paia but is burned in the Puunene Mill boilers. The existing fuel oil storage tanks are being used for storage of specification used oil, and were not replaced with new tanks.
2. The original CSP application proposed a limitation on spec used oil use of 5% of total fuel oil burned. This was later increased to 10% of total fuel oil, or 650,000 gallons (Ref: HC&S letter dated March 13, 1996), and then to 1 million gallons per year in Boilers 1 and 2 (Ref: HDOH approval letter dated June 8, 2005; see below).

b. Increase Allowable Specification Used Oil Use to 1.5 Million Gallons per Year

In 2005, HDOH approved HC&S's request to allow the use of up to 1 million gallons per year of used oil purchased from in-state recycling companies in Boilers 1 and 2. This

approval was based on a demonstration that the substitution of one million gallons of specification used oil for the heat input equivalent (0.97 million gallons) of #6 fuel oil would result in reductions in NOx, SO_2 and PM emissions and essentially no change in NMHC or CO emissions from the boilers. With this application, HC&S is requesting approval to expand this existing approval to include Boiler 3, and to burn an additional 500,000 gallons per year of commercially-obtained specification used oil, either in place of fuel oil #2 in Boiler 3 or in place of #6 fuel oil in Boilers 1 and 2, for a total of up to 1.5 million gallons per year in all three boilers. The attached tables show that the use of 1.5 million gallons per year of specification used oil in the boilers will not result in a significant emissions increase, so it can be approved as an insignificant activity under HAR 11-60.1-82 (f)(7).

Table 1
Emission Factors for Specification Used Oil Compared to #2 Fuel Oil in Boiler 3 and #6 Fuel Oil in Boilers 1 and 2

Fuel	Emission Factors				
	NOx	SO2	CO	NMHC	PM10
Spec Used Oil Emissions (Boilers 1 and 2)	32 lb/1000 gal (Note 1)	117.8 lb/1000 gal (Notes 1&2)	5 lb/1000 gal (Note 1)	0.76 lb/1000 gal (Note 1)	10.11 lb/1000 gal (Notes 1&2)
Spec Used Oil Emissions (Boiler 3)	32 lb/1000 gal (Note 1)	78.5 lb/1000 gal (Notes 1&2)	5 lb/1000 gal (Note 1)	0.76 lb/1000 gal (Note 1)	7.82 lb/1000 gal (Notes 1&2)
#6 Fuel Oil Emissions Boilers 1 and 2	45.1 lb/1000 gal (Note 3)	210.4 lb/1000 gal (Note 4)	5.8 lb/1000 gal (Note 3)	0.76 lb/1000 gal (Note 4)	14.4 lb/1000 gal (Note 3)
#2 Fuel Oil Emissions Boiler 3	40.8 lb/1000 gal (Note 5)	78.5 lb/1000 gal (Note 4)	1.41 lb/1000 gal (Note 6)	0.2 lb/1000 gal (Note 7)	13.59 lb/1000 gal (Note 5)

Note 1: AP-42 Table 1.3-1 (#6 fuel oil). Although it is anticipated that used oil will now comprise the majority of fuel oil burned in the boilers, criteria emission factors for fuel oil #6 are used here in lieu of the waste oil emission factors in AP-42 Section 1.11 because waste oil emission factors provided are for small boilers and space heaters, not large boilers such as those at Puunene Mill, and because waste oil emission factors are generally of lower quality (rated "D", or "below average").

Note 2: Sulfur content for Boilers 1&2: 0.75%; for Boiler 3: 0.5%. Emission factors are based on uncontrolled emission rates; actual emissions will be somewhat lower due to the wet scrubber.

Note 3: October 1992 HC&S stack test

Note 4: AP-42; sulfur content ±1.34%

Note 5: Calculated from heat content of #2 oil and NSPS Subpart D emission limit

Note 6: April 2005 HC&S stack test

Note 7: AP-42 Table 1.3-3 (#2 fuel oil).

Table 2
Comparison of Annual Emissions
1.5MM Gallons Spec Used Oil vs. Equivalent Amount of #2 Fuel Oil in Boiler 3 and #6 Fuel Oil in Boilers 1 and 2

Fuel/Quantity (Note 1)	Annual Emissions, tons				
	NOx	SO2	CO	NMHC	PM10
Spec Used Oil, Boiler 3 (1.5 MM gallons)	24.0	58.9	3.8	0.6	5.9
#2 Fuel Oil, Boiler 3 (1.55 MM gallons)	31.60	60.82	1.10	0.15	10.53
Expected Change, Annual Emissions	-7.60	-1.94	2.65	0.42	-4.67
Spec Used Oil, Boilers 1 and 2 (1.5 MM gallons)	24.0	88.4	3.8	0.6	7.6
#6 Fuel Oil, Boilers 1 and 2 (1.455 MM gallons)	32.72	152.63	4.21	0.55	10.45
Expected Change, Annual Emissions	-8.72	-93.75	-0.46	0.02	-4.58
Insignificant Emissions Increase §11-60.1-82(f)(7)	2.0	2.0	5.0	2.0	2.0

Note 1: Heat content of used oil is 5.9 MMBtu/bbl (HC&S 2004 analyses); heat content of #2 oil is 5.7 MMBtu/bbl (HC&S 2005 analysis). Therefore, each gallon of used oil fired replaces 1.03 gallons of #2 oil.

Note 2: Heat content of #6 oil is 6.1 MMBtu/bbl (HC&S 2004 analysis). Therefore, each gallon of used oil fired replaces 0.97 gallons of #6 oil.

Attachment 4

Updated Facility Emissions

Attachment 4a: Criteria Pollutants

In the original CSP application, facility emissions were calculated based on actual historical fuel use for the facility. The calculations have been revised to reflect potential to emit, currently permitted emission limits and currently permitted limits on fuel use. The calculations are shown in Attachment 4b. The applicable emission limits are as follows:

Permitted Emission Limits: Boilers 1 and 2		
Fuel	**Pollutant**	**Emission Limit**
Bagasse	PM	0.4 lb/100 lb bagasse
Coal	NOx	0.65 lb/MMBtu
Coal	NOx	222.7 lb/hr
Coal	PM	0.24 lb/MMBtu

Permitted Emission Limits: Boiler 3		
Fuel	**Pollutant**	**Emission Limit**
Bagasse	PM	0.4 lb/100 lb bagasse
Coal	NOx	0.7 lb/MMBtu[1]
Coal	SO_2	1.2 lb/MMBtu[1,2]
Coal	PM	0.10 lb/MMBtu[1]
Fuel Oil	NOx	0.3 lb/MMBtu[1]
Fuel Oil	SOx	0.8 lb/MMBtu[1,2]
Fuel Oil	PM	0.10 lb/MMBtu[1]

Changes from the original CSP application:

1. Boiler 3 is subject to 40 CFR 60 Subpart D. NOx limits from §60.44; PM limit from §60.42; SO2 limits from §60.43.
2. SO_2 emissions are also controlled by permit limits on fuel sulfur content in coal, fuel oil, and used oil (maximum 0.5% by weight).

The applicable fuel use limits are as follows:

Proposed Permitted Fuel Use Limits: Boilers 1 and 2	
Fuel	**Annual Limit**
Coal	54,680 tons/yr (total, both boilers)
Specification used oil	1.5 million gallons/yr (total, all boilers)[1]
Biomass	No minimum requirement, with conditions[2]
Proposed Permitted Fuel Use Limits: Boiler 3	
Fuel	**Annual Limit**
Coal	45,000 tons/yr[3]
Cooking oil	1 million gallons/yr[4]
Specification used oil	0.5 million gallons/yr[1]
Biomass	No minimum requirement, with conditions[2]

Changes from the original CSP application:

1. Currently, one million gallons of specification used oil per year may be burned in Boilers 1 and 2. (Ref: HC&S letter dated May 24, 2005; HDOH approval dated June 2, 2005). HC&S is requesting an increase to 1.5 million gallons per year, with up to 0.5 million gallons per year being used in Boiler 3. This proposed change is discussed further in Attachment 3.
2. As discussed with the Department, HC&S believes that removing the biomass boiler designation for the Puunene boilers would not be a modification under the federal definition. HC&S requested the addition of conditions to the permit that would allow the minimum annual capacity factor for biomass of 50% to be modified without triggering the requirements related to federal permit modifications and included proposed conditions. (Ref: HC&S letters dated August 5, 1999, and June 26, 2000)
3. HC&S requested elimination of the annual heat input limit for coal of 35% and retention of the existing and more limiting 45,000 ton per year limit. (Ref: HC&S letter to HDOH dated August 8, 1997, and Sierra Research memo to EPA dated November 1, 2000)
4. HC&S requested approval to burn one million gallons of cooking oil per year in Boiler 3. (Ref: HC&S letters dated October 10, 2002, November 25, 2002, and May 31, 2004) HDOH approved combustion of a total of one million gallons (Ref: HDOH approval dated July 6, 2004)

Annual criteria pollutant emissions from the boilers, based on the emission limits, fuel sulfur content limits, and fuel use limits provided above, are shown in the table below.

Criteria Pollutant Emissions from Significant Sources at Puunene Mill					
Emissions Source	Emissions, tons per year				
	NOx	SO_2	CO	NMHC	PM/PM_{10}
Boilers 1 and 2	678.6	729.7	7,829.6	406.7	479.1
Boiler 3	880.1	693.1	3,756.6	59.7	211.5
Total	1,558.7	1,411.3	11,586.2	466.4	690.6

Attachment 4b

Calculation of Potential to Emit, Criteria Pollutant Emissions

Calculation of Potential to Emit
HC&S Puunene Mill
revised 3/07 to include proposed spec oil use

Fuel	Hourly Heat Input (MMBtu)	Emission Factor (lb/MMBtu) NOx	SO2	CO	NMHC	PM	Emissions, lb/hr NOx	SO2	CO	NMHC	PM
Boilers 1 and 2											
Bagasse	212	0.264	0.066	4.216	0.219	0.258	55.97	13.99	893.79	46.43	54.70
Spec used oil	173	0.42	0.75	0.048	0.005	0.181	72.66	129.75	8.30	0.87	31.31
#2 Oil	173	0.42	0.5	0.048	0.005	0.181	72.66	86.50	8.30	0.87	31.31
Coal	192	0.65	0.85	0.477	0.005	0.24	124.80	163.20	91.58	0.96.	46.08
Wood chips	212	0.167	0.0083	1.51	0.024	0.052	35.40	1.76	320.12	5.09	11.02
MAX LB/HR, ANY FUEL							124.8 coal	163.2 coal	893.8 bagasse	46.4 bagasse	54.7 bagasse
Total, two boilers							222.7	326.4	1787.6	92.9	109.4

Based on 8760 hrs/hr of operation and 50% biomass requirement, allowable fuel combinations would be:

Scenario	Fuel	Hrs/yr	MMBtu/yr	% of Btus	Emissions, tpy NOx	SO2	CO	NMHC	PM
1	Bagasse	3937	834,644	50.0%	110.2	27.5	1759.4	91.4	107.7
	#2 oil	3605	623,665	37.4%	131.0	155.9	15.0	1.6	56.4
	Spec used oil	1218	210,714	12.6%	44.2	79.0	5.1	0.5	19.1
	Total		1,669,023		285.4	262.5	1779.5	93.5	183.2
2	Wood chips	3937	834,644	50.0%	69.7	3.5	630.2	10.0	21.7
	#2 oil	3605	623,665	37.4%	131.0	155.9	15.0	1.6	56.4
	Spec used oil	1218	210,714	12.6%	44.2	79.0	5.1	0.5	19.1
	Total		1,669,023		244.9	238.4	650.2	12.1	97.2
3	Bagasse	4164	882,768	50.9%	116.5	29.1	1860.9	96.7	113.9
	#2 oil	494	85,445	4.9%	17.9	21.4	2.1	0.2	7.7
	Spec used oil	1218	210,714	12.2%	44.2	79.0	5.1	0.5	19.1
	Coal	2884	553,747	32.0%	160.6	235.3	132.1	1.4	66.4
	Total		1,732,674		339.3	364.9	2000.1	98.8	207.1
4	Bagasse	8760	1,857,120	100%	245.1	61.3	3914.8	203.4	239.6
5	Wood chips	8760	1,857,120	100%	155.1	7.7	1,402.1	22.3	48.3
MAX TPY, ANY SCENARIO					339.3	364.9	3914.8	203.4	239.6
Total, two boilers					bagasse/ #2 oil/ spec oil/ coal 678.6	bagasse/ #2 oil/ spec oil/ coal 729.7	100% bagasse 7829.6	100% bagasse 406.7	100% bagasse 479.1

Annual coal use in Boilers 1&2 limited to 54,680 tpy. At 10,127 Btu/lb, this is equivalent to 553,744 tons per year of coal per boiler.
Annual spec used oil use in Boilers 1&2 limited to 1 MMgal/yr. HC&S has proposed to increase this to 1.5 MMgal/yr. Since the allowable sulfur content is higher for Boilers 1 and 2 than for Boiler 3, the highest SO2 emissions will occur if the spec oil is burned in Boilers 1 and 2. At 5.9 MMBtu/bbl, this is equivalent to 105,357 MMBtu per year of spec used oil per boiler.

Calculation of Potential to Emit
HC&S Puunene Mill
Rev 307 to include permitted cooking oil use

Fuel	Hourly Heat Input (MMBtu)	Emission Factor (lb/MMBtu) NOx	SO2	CO	NMHC	PM	Emissions, lb/hr NOx	SO2	CO	NMHC	PM
Boiler 3											
Bagasse	568	0.296	0.012	0.716	0.024	0.085	168.13	6.82	406.69	13.63	48.28
#2 Oil/spec oil	392	0.3	0.5	0.048	0.005	0.014	117.60	196.00	18.82	1.96	5.49
Cooking oil	392	0.1461	0.0001	0.0735	0.0076	0.036	57.27	0.04	28.81	2.98	14.11
Coal	437	0.7	0.85	0.105	0.003	0.1	305.90	371.45	45.89	1.31	43.70
Wood chips	568	0.167	0.0083	1.51	0.024	0.052	94.86	4.71	857.68	13.63	29.54
MAX LB/HR, ANY FUEL							305.9 coal	371.5 coal	857.7 wood chips	13.6 bagasse	48.3 bagasse

Based on 8760 hrs/hr of operation and 50% biomass requirement, allowable fuel combinations would be:

Scenario	Fuel	Hrs/yr	MMBtu/yr	% of Btus	Emissions, tpy NOx	SO2	CO	NMHC	PM
1	Bagasse	3577	2,031,736	50.0%	300.7	12.2	727.4	24.4	86.3
	#2 oil	5183	2,031,736	50.0%	304.8	507.9	48.8	5.1	14.2
	Total		4,063,472		605.5	520.1	776.1	29.5	100.6
2	Wood chips	3577	2,031,736	50.0%	169.6	8.4	1,534.0	24.4	52.8
	#2 oil	5183	2,031,736	50.0%	304.8	507.9	48.8	5.1	14.2
	Total		4,063,472		474.4	516.4	1,582.7	29.5	67.0
3	Bagasse	6674	3,791,031	80.6%	561.1	22.7	1,357.2	45.5	161.1
	#2 oil	0	-	0.0%	0.0	0.0	0.0	0.0	0.0
	Coal	2086	911,429	19.4%	319.0	387.4	47.9	1.4	45.6
	Total		4,702,460		880.1	410.1	1,405.0	46.9	206.7
4	Bagasse	3674	2,087,031	50.0%	308.9	12.5	747.2	25.0	88.7
	#2 oil	3000	1,176,000	28.2%	176.4	294.0	28.2	2.9	8.2
	Coal	2086	911,429	21.8%	319.0	387.4	47.9	1.4	45.6
	Total		4,174,460		804.3	693.9	823.2	29.4	142.5
4	Wood chips	3674	2,087,031	50.0%	174.3	8.7	1,575.7	25.0	54.3
	#2 oil	3000	1,176,000	28.2%	176.4	294.0	28.2	2.9	8.2
	Coal	2086	911,429	21.8%	319.0	387.4	47.9	1.4	45.6
	Total		4,174,460		669.7	690.0	1,651.8	29.4	108.1
5	Bagasse	8760	4,975,680	100%	736.4	29.9	1,781.3	59.7	211.5
6	Wood chips	8760	4,975,680	100%	415.5	20.6	3,756.6	59.7	129.4
MAX TPY, ANY SCENARIO					880.1	693.9	3,756.6	59.7	211.5
					bagasse/ coal	bagasse/ #2 oil/ coal	100% wood chips	100% bagasse	bagasse

Annual coal use in Boiler 3 limited to 45,000 tpy. At 10,127 Btu/lb, this is equivalent to
911,430 tons per year of coal.
Annual cooking oil use in Boiler 3 is limited to 1 MMgal/yr. At 5.2 MMBtu/bbl, this is equivalent to
123,810 MMBtu/yr of cooking oil

Attachment 4c: Noncriteria Pollutants

This section replaces the evaluation of noncriteria pollutant emissions from the boilers that was provided in the original CSP application.

Maximum annual noncriteria pollutant emissions were estimated for the Puunene boilers for each allowable fuel using fuel-specific emission factors. Annual emissions were calculated using the permitted fuel use limits shown above and the following emission factor sources:

- Bagasse: engineering tests and literature search
- Coal: AP-42 and coal fuel analyses
- #2 fuel oil: AP-42
- Specification used oil: Permit specifications for constituent metals
- Wood chips: AP-42

In addition, as discussed in more detail in the Regulatory Compliance section of the application, since the Puunene Mill is a major source of HAPs, the boilers are subject to the Industrial, Commercial and Institutional Boiler MACT. The MACT limits emission rates of specific hazardous air pollutants (HAPs), and these limits are reflected in the emissions calculations.

Calculated emissions for each fuel are provided in Attachment 4d. These calculations show that the highest emissions of noncriteria pollutant emissions will occur when the boilers are fired on 100% bagasse. This is a theoretical limit, as the mill does not produce sufficient bagasse to fire the boilers without supplemental fuel. Potential annual HAPs emissions are summarized in the table below.

Summary of Noncriteria Pollutant Emissions at Puunene Mill			
Boiler(s)	**Fuel**	**HAP Emission Rate, lb/MMBtu fuel[a]**	**HAPs Potential to Emit, tpy[b]**
1 and 2	Wood Chips	0.00651	
	Specification Used Oil	0.00640	
	Coal	0.00534	
	No. 2 Fuel Oil	0.00037	
	Bagasse	0.03586	114.8
3	Wood Chips	0.00651	
	Specification Used Oil	0.00640	
	Coal	0.00534	
	No. 2 Fuel Oil/Cooking Oil	0.00037	
	Bagasse	0.02310	57.5
Total			172.3

Note: a. Emission factor sources and calculated emissions of individual HAPs by fuel are shown in Attachment 4d.

b. As bagasse has the highest HAP emission rate per MMBtu of fuel burned, PTE is highest for 100% bagasse firing in each boiler and only PTE from bagasse firing is shown.

Attachment 4d

Calculation of Potential to Emit, Noncriteria Pollutant Emissions

HCS Puunene Boilers 1 and 2
Maximum Individual HAP Emissions: Coal Fuel

Fuel	Annual Max Fuel Use, tpy	Pollutant	Em Factor, lb/ton	Source (1)	Metal Conc, ug/g (2)	Em Fac, lb/MMBtu	Emissions, tpy
Coal	54,680	1,2-Dichloroethane (Ethylene dichloride)	4.00E-05	AP-42			1.09E-03
		2-Chloroacetophenone	7.00E-06	AP-42			1.91E-04
		2,4-Dinitrotoluene	2.80E-07	AP-42			7.66E-06
		Acetaldehyde	5.70E-04	AP-42			1.56E-02
		Acetophenone	1.50E-05	AP-42			4.10E-04
		Acrolein	2.90E-04	AP-42			7.93E-03
		Antimony	2.80E-02	sample	14		0.77
		Arsenic			included below under TSMs		
		Benzene	1.30E-03	AP-42			3.55E-02
		Benzyl Chloride	7.00E-04	AP-42			1.91E-02
		Beryllium			included below under TSMs		
		Bromoform	3.90E-05	AP-42			1.07E-03
		Cadmium			included below under TSMs		
		Carbon Disulfide	1.30E-04	AP-42			3.55E-03
		Chlorobenzene	2.20E-05	AP-42			6.01E-04
		Chloroform	5.90E-05	AP-42			1.61E-03
		Chromium (total)			included below under TSMs		
		Cobalt	3.00E-04	sample	0.15		8.20E-03
		Cumene	5.30E-06	AP-42			1.45E-04
		Cyanide	2.50E-03	AP-42			6.84E-02
		Dimethyl sulfate	4.80E-05	AP-42			1.31E-03
		Dioxins/Furans	1.76E-09	AP-42			4.81E-08
		Ethylbenzene	9.40E-05	AP-42			2.57E-03
		Ethyl chloride (Chloroethane)	4.20E-05	AP-42			1.15E-03
		Ethylene dibromide	1.20E-06	AP-42			3.28E-05
		Formaldehyde	2.40E-04	AP-42			6.56E-03
		Hexane	6.70E-05	AP-42			1.83E-03
		Hydrochloric acid (3)				0.001	0.55
		Hydrogen fluoride (4)	3.00E-02	AP-42			0.82
		Isophorone	5.80E-04	AP-42			1.59E-02
		Lead	4.20E-04	AP-42	included below under TSMs		
		Manganese	4.90E-04	AP-42	included below under TSMs		
		Mercury (3)				9.00E-06	4.98E-03
		Methyl Bromide	1.60E-04	AP-42			4.37E-03
		Methyl Chloride	5.30E-04	AP-42			1.45E-02
		Methyl Ethyl Ketone	3.90E-04	AP-42			1.07E-02
		Methyl hydrazine	1.70E-04	AP-42			4.65E-03
		Methyl methacrylate	2.00E-05	AP-42			5.47E-04
		Methyl tert butyl ether	3.50E-05	AP-42			9.57E-04
		Methylene chloride	2.90E-04	AP-42			7.93E-03
		Nickel			included below under TSMs		
		PAHs	1.60E-05	sum of individual components			4.38E-04
		5-Methyl Chrysene	2.20E-08	AP-42			
		Biphenyl	1.70E-06	AP-42			
		Acenaphthene	5.10E-07	AP-42			
		Acenaphthylene	2.50E-07	AP-42			
		Anthracene	2.10E-07	AP-42			
		Benzo(a)anthracene	8.00E-08	AP-42			
		Benzo(a)pyrene	3.80E-08	AP-42			
		Benzo(b)fluoranthene	1.10E-07	AP-42			
		Benzo(g,h,I)perylene	2.70E-08	AP-42			
		Chrysene	1.00E-07	AP-42			
		Fluoranthene	7.10E-07	AP-42			
		Fluorene	9.10E-07	AP-42			
		Indeno(1,2,3-cd)pyrene	6.10E-08	AP-42			
		Naphthalene	1.30E-05	AP-42			
		Pyrene	3.30E-07	AP-42			
		Phenol	1.60E-05	AP-42			4.37E-04
		Propionaldehyde	3.80E-04	AP-42			1.04E-02

HCS Puunene Boilers 1 and 2
Maximum Individual HAP Emissions: Coal Fuel

Fuel	Annual Max Fuel Use, tpy	Pollutant	Em Factor, lb/ton	Source (1)	Metal Conc, ug/g (2)	Em Fac, lb/MMBtu	Emissions, tpy
		Selenium			included below under TSMs		
		Styrene	2.50E-05	AP-42			6.84E-04
		Tetrachoroethene	4.30E-05	AP-42			1.18E-03
		Toluene	2.40E-04	AP-42			6.56E-03
		Tricholorethene	2.00E-05	AP-42			5.47E-04
		TSMs (3,5)				0.001	5.54E-01
		Vinyl Acetate	7.60E-06	AP-42			2.08E-04
		Xylene	3.70E-05	AP-42			1.01E-03
		Total					**3.0**

Notes:
1. AP-42, Tables 1.1-12, 1.1-13, 1.1-14, 1.1-15 and 1.1-18; 9/98.
2. From analysis of coal sample: updated 4/06.
3. Subpart DDDDD limit.
4. Assume 80% control from wet scrubber.
5. TSMs consist of arsenic, beryllium, cadmium, chromium, lead, manganese, nickel and selenium.

0.0053 lb HAPs/MMBtu

Annual max fuel use @ 11870 Btu/lb 1107488.72 MMBtu/yr

HCS Puunene Boilers 1 and 2
Maximum Individual HAP Emissions: Spec Used Oil

Fuel	Annual Max Fuel Use, MMBtu/yr	Pollutant	Em Factor, lb/MMBtu	Source	Emissions, tpy
Spec Used Oil	210,714	Arsenic	included below under TSMs		
		Beryllium	included below under TSMs		
		Cadmium	included below under TSMs		
		Chromium	included below under TSMs		
		Lead	included below under TSMs		
		Mercury	3.00E-12	AP-42 (2)	3.16E-10
		Manganese	included below under TSMs		
		Nickel	included below under TSMs		
		Selenium	included below under TSMs		
		Formaldehyde	3.43E-04	AP-42 (3)	3.61E-02
		PCBs	1.01E-04	AP-42 (1)	1.07E-02
		POM	2.36E-05	AP-42 (3)	2.48E-03
		TSMs (5)	0.001	4	1.05E-01
		Total			1.55E-01

0.00147 lb HAPs
per MMBtu

Notes:
1. Specification Allowable Limit. ppm converted to lb/MMBtu using 7.1 lb/gal and 140,000 Btu/gal.
2. AP-42 Table 1.3-10.
3. AP-42 Table 1.3-8. Emission factors in lb/1000 gal converted to lb/MMBtu using 140,000 Btu/gal.
4. Subpart DDDDD limit.

HCS Puunene Boilers 1 and 2
Maximum Individual HAP Emissions: No. 2 Fuel Oil

Fuel	Annual Max Fuel Use, MMBtu/yr	Pollutant	Em Factor, lb/MMBtu	Source	Emissions, tpy
No. 2 fuel oil	1,668,758	Arsenic	4.00E-12	AP-42 (1)	3.34E-09
		Beryllium	3.00E-12	AP-42 (1)	2.50E-09
		Cadmium	3.00E-12	AP-42 (1)	2.50E-09
		Chromium	3.00E-12	AP-42 (1)	2.50E-09
		Lead	9.00E-12	AP-42 (1)	7.51E-09
		Mercury	3.00E-12	AP-42 (1)	2.50E-09
		Manganese	6.00E-12	AP-42 (1)	5.01E-09
		Nickel	3.00E-12	AP-42 (1)	2.50E-09
		Selenium	1.50E-11	AP-42 (1)	1.25E-08
		Formaldehyde	3.43E-04	AP-42 (2)	2.86E-01
		POM	2.36E-05	AP-42 (2)	1.97E-02
		Total			3.06E-01

0.00037 lb HAPs per MMBtu

Notes:
1. AP-42 Table 1.3-10.
2. AP-42 Table 1.3-8. Emission factors in lb/1000 gal converted to lb/MMBtu using 140,000 Btu/gal.

HCS Puunene Boilers 1 and 2
Maximum Individual HAP Emissions: Bagasse Fuel

Fuel	Annual Max Fuel Use, MMBtu/yr	Pollutant	Emission Factor, lb/MMBtu (1)	Emissions, tons/yr
Bagasse	3,714,240	Formaldehyde	8.82E-03	16.38
		Methanol	5.25E-04	0.97
		Phenol	1.45E-04	0.27
		Dibenzofuran	8.46E-05	0.16
		bis(2-ethylhexyl)phthalate	3.92E-06	0.01
		Naphthalene	1.94E-03	3.60
		Acenapthene	5.69E-05	0.11
		2-Methylnapthalene	2.15E-04	0.40
		Acenapthylene	1.19E-05	0.02
		Fluorene	3.10E-05	0.06
		Pyrene	1.53E-04	0.28
		Anthracene	3.22E-06	0.01
		Fluoranthene	4.14E-05	0.08
		Pyarine	2.32E-05	0.04
		Benzo(a)anthracene	1.13E-06	0.00
		Chrysene	2.34E-06	0.00
		Benzo(a)fluoranthene	3.91E-06	0.01
		Benzo(k)fluoranthene	6.72E-07	0.00
		Benzo(e)pyrene	1.97E-06	0.00
		Benzo(a)pyrene	4.02E-07	0.00
		Perylene	3.78E-08	0.00
		Indeno(1,2,3-cd)pyrene	1.76E-06	0.00
		Dibenzo(a,h)anthracene	1.57E-07	0.00
		Benzo(g,h,I)perylene	2.92E-06	0.01
		Benzene	4.52E-02	83.94
		Toluene	2.37E-03	4.40
		Ethyl benzene	2.32E-04	0.43
		Styrene	6.97E-04	1.29
		Hydrogen chloride	1.03E-03	1.91
		Arsenic	7.65E-06	0.01
		Beryllium	2.03E-07	0.00
		Cadmium	1.35E-06	0.00
		Chromium	1.12E-05	0.02
		Lead	1.12E-05	0.02
		Manganese	1.74E-04	0.32
		Mercury	4.26E-07	0.00
		Nickel	1.27E-05	0.02
		Selenium	1.05E-07	0.00
		Total		**114.80**

Note: 1. Engineering test results

0.06182 lb HAPs per MMBtu

HCS Puunene Boilers 1 and 2
Maximum Individual HAP Emissions: Wood Waste Fuel

Fuel	Annual Max Fuel Use, MMBtu/yr	Pollutant	Em Factor, lb/MMBtu	Source (1)	Emissions, tpy
Wood	3,714,240	Acetaldehyde	1.59E-04	AP-42*	0.30
		Acetophenone	3.20E-09	AP-42	5.94E-06
		Acrolein	1.10E-03	AP-42*	2.04
		Benzene	2.72E-04	AP-42*	0.51
		2-Butanone (MEK)	5.40E-06	AP-42	1.00E-02
		Carbon Tetrachloride	4.50E-05	AP-42	0.08
		Chlorobenzene	3.30E-05	AP-42	6.13E-02
		Chloroform	2.80E-05	AP-42	5.20E-02
		Ethylene Dichloride	2.90E-05	AP-42	5.39E-02
		Dichloromethane (Methylene Chloride)	2.90E-04	AP-42	0.54
		1,2-Dichloropropane	3.30E-05	AP-42	6.13E-02
		2,4-Dinintrophenol	1.80E-07	AP-42	3.34E-04
		Ethyl Benzene	3.10E-05	AP-42	5.76E-02
		Formaldehyde	6.22E-04	AP-42*	1.2
		Hydrochloric Acid	8.10E-04	AP-42*	1.5
		4-Nitrophenol	2.40E-07	AP-42	4.46E-04
		Phenol	5.10E-05	AP-42	0.09
		Dioxins/Furans	1.67E-06	sum of individual components	3.10E-03
		Dioxin: 4D total	4.70E-10	AP-42	
		Dioxin: 5D total	1.50E-09	AP-42	
		Dioxin:6D Total	1.60E-06	AP-42	
		Dioxin:7D Total	2.00E-09	AP-42	
		Dioxin:8D	6.60E-08	AP-42	
		Furan:4F Total	7.50E-10	AP-42	
		Furan:5F Total	4.20E-10	AP-42	
		Furan:6F Total	2.80E-10	AP-42	
		Furan:7F Total	2.40E-10	AP-42	
		Furan:8F	8.80E-11	AP-42	
		PCBs	5.55E-09	sum of individual components	1.03E-05
		Decachlorinated biphenyls	2.70E-10	AP-42	
		Dichlorinated biphenyls	7.40E-10	AP-42	
		Heptachlorinated biphenyls	6.60E-11	AP-42	
		Hexachlorinated biphenyls	5.50E-10	AP-42	
		Monochlorinated	2.20E-10	AP-42	
		Pentachlorinated biphenyls	1.20E-09	AP-42	
		Tetrachlorinated biphenyls	2.50E-09	AP-42	
		PAHs	1.25E-04	sum of individual components	0.23
		2-Chloronaphthalene	2.40E-09	AP-42	
		2-Methylnaphthalene	1.60E-07	AP-42	
		Acenaphthene	9.10E-07	AP-42	
		Acenaphthylene	5.00E-06	AP-42	
		Anthracene	3.00E-06	AP-42	
		Benzo(a)anthracene	6.50E-08	AP-42	
		Benzo(a)pyrene	2.60E-06	AP-42	

HCS Puunene Boilers 1 and 2
Maximum Individual HAP Emissions: Wood Waste Fuel

Fuel	Annual Max Fuel Use, MMBtu/yr	Pollutant	Em Factor, lb/MMBtu	Source (1)	Emissions, tpy
		Benzo(b)fluoranthene	1.00E-07	AP-42	
		Benzo(e)pyrene	2.60E-09	AP-42	
		Benzo(g,h,I)perylene	9.80E-08	AP-42	
		Benzo(k)fluoranthene	1.60E-07	AP-42	
		Chrysene	3.80E-08	AP-42	
		Dibenz(a,h)anthracene	9.10E-09	AP-42	
		Fluoranthene	1.60E-06	AP-42	
		Fluorene	3.40E-06	AP-42	
		Indeno(1,2,3-cd)pyrene	8.70E-08	AP-42	
		Naphthalene	9.70E-05	AP-42	
		Perylene	5.20E-10	AP-42	
		Phenanthrene	7.00E-06	AP-42	
		Pyrene	3.70E-06	AP-42	
		Styrene	1.86E-03	AP-42	3.45
		Tetrachloroethane	3.10E-05	AP-42	0.06
		Toluene	9.20E-04	AP-42	1.71
		1.1.1-Tricloroethane	3.10E-05	AP-42	0.06
		Trichlorophenol	2.20E-08	AP-42	0.00
		Vinyl Chloride	1.00E-05	AP-42	0.02
		Xylene	2.50E-05	AP-42	0.05
		Total			**12.1**

Note: 1. AP-42, Table 1.6-3, 3/02, except where starred. For starred factors, individual emission factors from the Section 1.6 database (http://www.epa.gov/ttn/chief/ap42/ch01/related/c01s06.html) were used that reflected stoker boiler equipped with wet scrubber.

0.0065 lb HAPs per MMBtu

HCS Puunene Boiler 3
Maximum Individual HAP Emissions: Coal Fuel

Fuel	Annual Max Fuel Use, tpy	Pollutant	Em Factor, lb/ton	Source (1)	Metal Conc, ug/g (2)	Em Fac, lb/MMBtu	Emissions, tpy
Coal	45,000	1,2-Dichloroethane (Ethylene dichloride)	4.00E-05	AP-42			9.00E-04
		2-Chloroacetophenone	7.00E-06	AP-42			1.58E-04
		2,4-Dinitrotoluene	2.80E-07	AP-42			6.30E-06
		Acetaldehyde	5.70E-04	AP-42			1.28E-02
		Acetophenone	1.50E-05	AP-42			3.38E-04
		Acrolein	2.90E-04	AP-42			6.53E-03
		Antimony		2.80E-02	14		0.63
		Arsenic			included below under TSMs		
		Benzene	1.30E-03	AP-42			2.93E-02
		Benzyl Chloride	7.00E-04	AP-42			1.58E-02
		Beryllium			included below under TSMs		
		Bromoform	3.90E-05	AP-42			8.78E-04
		Cadmium			included below under TSMs		
		Carbon Disulfide	1.30E-04	AP-42			2.93E-03
		Chlorobenzene	2.20E-05	AP-42			4.95E-04
		Chloroform	5.90E-05	AP-42			1.33E-03
		Chromium (total)			included below under TSMs		
		Cobalt		3.00E-04	0.15		6.75E-03
		Cumene	5.30E-06	AP-42			1.19E-04
		Cyanide	2.50E-03	AP-42			5.63E-02
		Dimethyl sulfate	4.80E-05	AP-42			1.08E-03
		Dioxins/Furans	1.76E-09	AP-42			3.96E-08
		Ethylbenzene	9.40E-05	AP-42			2.12E-03
		Ethyl chloride (Chloroethane)	4.20E-05	AP-42			9.45E-04
		Ethylene dibromide	1.20E-06	AP-42			2.70E-05
		Formaldehyde	2.40E-04	AP-42			5.40E-03
		Hexane	6.70E-05	AP-42			1.51E-03
		Hydrochloric acid (3)				0.001	0.46
		Hydrogen fluoride (4)	3.00E-02	AP-42			0.68
		Isophorone	5.80E-04	AP-42			1.31E-02
		Lead	4.20E-04	AP-42	included below under TSMs		
		Manganese	4.90E-04	AP-42	included below under TSMs		
		Mercury (3)				9.00E-06	4.10E-03
		Methyl Bromide	1.60E-04	AP-42			3.60E-03
		Methyl Chloride	5.30E-04	AP-42			1.19E-02
		Methyl Ethyl Ketone	3.90E-04	AP-42			8.78E-03
		Methyl hydrazine	1.70E-04	AP-42			3.83E-03
		Methyl methacrylate	2.00E-05	AP-42			4.50E-04
		Methyl tert butyl ether	3.50E-05	AP-42			7.88E-04
		Methylene chloride	2.90E-04	AP-42			6.53E-03
		Nickel			included below under TSMs		
		PAHs	1.60E-05	sum of individual			3.60E-04
		5-Methyl Chrysene	2.20E-08	AP-42			
		Biphenyl	1.70E-06	AP-42			
		Acenaphthene	5.10E-07	AP-42			
		Acenaphthylene	2.50E-07	AP-42			
		Anthracene	2.10E-07	AP-42			
		Benzo(a)anthracene	8.00E-08	AP-42			
		Benzo(a)pyrene	3.80E-08	AP-42			
		Benzo(b)fluoranthene	1.10E-07	AP-42			
		Benzo(g,h,I)perylene	2.70E-08	AP-42			
		Chrysene	1.00E-07	AP-42			
		Fluoranthene	7.10E-07	AP-42			
		Fluorene	9.10E-07	AP-42			
		Indeno(1,2,3-cd)pyrene	6.10E-08	AP-42			

HCS Puunene Boiler 3
Maximum Individual HAP Emissions: Coal Fuel

Fuel	Annual Max Fuel Use, tpy	Pollutant	Em Factor, lb/ton	Source (1)	Metal Conc, ug/g (2)	Em Fac, lb/MMBtu	Emissions, tpy
		Naphthalene	1.30E-05	AP-42			
		Pyrene	3.30E-07	AP-42			
		Phenol	1.60E-05	AP-42			3.60E-04
		Propionaldehyde	3.80E-04	AP-42			8.55E-03
		Selenium			included below under TSMs		
		Styrene	2.50E-05	AP-42			5.63E-04
		Tetrachoroethene	4.30E-05	AP-42			9.68E-04
		Toluene	2.40E-04	AP-42			5.40E-03
		Tricholorethene	2.00E-05	AP-42			4.50E-04
		TSMs (3,5)				0.001	4.56E-01
		Vinyl Acetate	7.60E-06	AP-42			1.71E-04
		Xylene	3.70E-05	AP-42			8.33E-04
		Total					**2.4**

Notes:
1. AP-42, Tables 1.1-12, 1.1-13, 1.1-14, 1.1-15 and 1.1-18; 9/98.
2. From analysis of coal sample: updated 4/06.
3. Subpart DDDDD limit.
4. Assume 80% control from wet scrubber.
5. TSMs consist of arsenic, beryllium, cadmium, chromium, lead, manganese, nickel and selenium.

Max coal use @ 10127 Btu/lb	911430	MMBtu/yr	0.0053	lb HAPs per MMBtu

HCS Puunene Boiler 3
Maximum Individual HAP Emissions: No. 2 Fuel Oil

Fuel	Annual Max Fuel Use, MMBtu/yr	Pollutant	Em Factor, lb/MMBtu	Source	Emissions, tpy
No. 2 fuel oil	2,031,736	Arsenic	4.00E-12	AP-42 (1)	4.06E-09
		Beryllium	3.00E-12	AP-42 (1)	3.05E-09
		Cadmium	3.00E-12	AP-42 (1)	3.05E-09
		Chromium	3.00E-12	AP-42 (1)	3.05E-09
		Lead	9.00E-12	AP-42 (1)	9.14E-09
		Mercury	3.00E-12	AP-42 (1)	3.05E-09
		Manganese	6.00E-12	AP-42 (1)	6.10E-09
		Nickel	3.00E-12	AP-42 (1)	3.05E-09
		Selenium	1.50E-11	AP-42 (1)	1.52E-08
		Formaldehyde	3.43E-04	AP-42 (2)	3.48E-01
		POM	2.36E-05	AP-42 (2)	2.39E-02
		Total			3.72E-01

0.00037 lb HAPs per MMBtu

Notes:
1. AP-42 Table 1.3-10.
2. AP-42 Table 1.3-8. Emission factors in lb/1000 gal converted to lb/MMBtu using 140,000 Btu/gal.

HCS Puunene Boiler 3
Maximum Individual HAP Emissions: Bagasse Fuel

Fuel	Max. Annual Fuel Use, MMBtu/yr	Pollutant	Emission Factor, lb/MMBtu (1)	Emissions, tpy
Bagasse	4,975,680	Formaldehyde	3.86E-03	9.60
		Methanol	4.23E-04	1.05
		Phenol	1.52E-04	0.38
		Dibenzofuran	2.69E-05	0.07
		bis(2-ethylhexyl)phthalate	3.64E-06	0.01
		Naphthalene	1.71E-03	4.25
		Acenapthene	4.35E-05	0.11
		2-Methylnapthalene	3.92E-04	0.98
		Acenapthylene	1.24E-05	0.03
		Fluorene	2.06E-05	0.05
		Pyrene	6.49E-05	0.16
		Anthracene	5.01E-06	0.01
		Fluoranthene	4.15E-05	0.10
		Pyarine	4.56E-05	0.11
		Benzo(a)anthracene	1.96E-06	0.00
		Chrysene	2.48E-06	0.01
		Benzo(a)fluoranthene	5.59E-06	0.01
		Benzo(k)fluoranthene	1.11E-06	0.00
		Benzo(e)pyrene	3.76E-06	0.01
		Benzo(a)pyrene	2.64E-06	0.01
		Perylene	4.35E-07	0.00
		Indeno(1,2,3-cd)pyrene	3.65E-06	0.01
		Dibenzo(a,h)anthracene	1.90E-07	0.00
		Benzo(g,h,I)perylene	8.97E-06	0.02
		Benzene	1.39E-02	34.58
		Toluene	4.40E-04	1.09
		Ethyl benzene	8.70E-05	0.22
		Styrene	9.34E-05	0.23
		Hydrogen chloride	1.50E-03	3.73
		Arsenic	6.16E-06	0.02
		Beryllium	3.36E-07	0.00
		Cadmium	9.75E-07	0.00
		Chromium	4.28E-06	0.01
		Lead	1.10E-05	0.03
		Manganese	2.24E-04	0.56
		Mercury	6.53E-07	0.00
		Nickel	3.92E-06	0.01
		Selenium	7.88E-08	0.00
		Total		**57.48**

Note: 1. Source: Engineering tests.

0.0231 lb HAPs per MMBtu

HCS Puunene Boiler 3
Maximum Individual HAP Emissions: Wood Waste Fuel

Fuel	Annual Max Fuel Use, MMBtu/yr	Pollutant	Em Factor, lb/MMBtu	Source (1)	Emissions, tpy
Wood	4,975,680	Acetaldehyde	1.59E-04	AP-42*	0.40
		Acetophenone	3.20E-09	AP-42	7.96E-06
		Acrolein	1.10E-03	AP-42*	2.74
		Benzene	2.72E-04	AP-42*	0.68
		2-Butanone (MEK)	5.40E-06	AP-42	1.34E-02
		Carbon Tetrachloride	4.50E-05	AP-42	0.11
		Chlorobenzene	3.30E-05	AP-42	8.21E-02
		Chloroform	2.80E-05	AP-42	6.97E-02
		Ethylene Dichloride	2.90E-05	AP-42	7.21E-02
		Dichloromethane (Methylene Chloride)	2.90E-04	AP-42	0.72
		1,2-Dichloropropane	3.30E-05	AP-42	8.21E-02
		2,4-Dinintrophenol	1.80E-07	AP-42	4.48E-04
		Ethyl Benzene	3.10E-05	AP-42	7.71E-02
		Formaldehyde	6.22E-04	AP-42*	1.5
		Hydrochloric Acid	8.10E-04	AP-42*	2.0
		4-Nitrophenol	2.40E-07	AP-42	5.97E-04
		Phenol	5.10E-05	AP-42	0.13
		Dioxins/Furans	1.67E-06	sum of individual components	4.16E-03
		Dioxin: 4D total	4.70E-10	AP-42	
		Dioxin: 5D total	1.50E-09	AP-42	
		Dioxin:6D Total	1.60E-06	AP-42	
		Dioxin:7D Total	2.00E-09	AP-42	
		Dioxin:8D	6.60E-08	AP-42	
		Furan:4F Total	7.50E-10	AP-42	
		Furan:5F Total	4.20E-10	AP-42	
		Furan:6F Total	2.80E-10	AP-42	
		Furan:7F Total	2.40E-10	AP-42	
		Furan:8F	8.80E-11	AP-42	
		PCBs	5.55E-09	sum of individual components	1.38E-05
		Decachlorinated biphenyl	2.70E-10	AP-42	
		Dichlorinated biphenyls	7.40E-10	AP-42	
		Heptachlorinated bipheny	6.60E-11	AP-42	
		Hexachlorinated biphenyl	5.50E-10	AP-42	
		Monochlorinated	2.20E-10	AP-42	
		Pentachlorinated bipheny	1.20E-09	AP-42	
		Tetrachlorinated biphenyl	2.50E-09	AP-42	
		PAHs	1.25E-04	sum of individual components	0.31
		2-Chloronaphthalene	2.40E-09	AP-42	
		2-Methylnaphthalene	1.60E-07	AP-42	
		Acenaphthene	9.10E-07	AP-42	
		Acenaphthylene	5.00E-06	AP-42	
		Anthracene	3.00E-06	AP-42	
		Benzo(a)anthracene	6.50E-08	AP-42	
		Benzo(a)pyrene	2.60E-06	AP-42	

HCS Puunene Boiler 3
Maximum Individual HAP Emissions: Wood Waste Fuel

Fuel	Annual Max Fuel Use, MMBtu/yr	Pollutant	Em Factor, lb/MMBtu	Source (1)	Emissions, tpy
		Benzo(b)fluoranthene	1.00E-07	AP-42	
		Benzo(e)pyrene	2.60E-09	AP-42	
		Benzo(g,h,I)perylene	9.80E-08	AP-42	
		Benzo(k)fluoranthene	1.60E-07	AP-42	
		Chrysene	3.80E-08	AP-42	
		Dibenz(a,h)anthracene	9.10E-09	AP-42	
		Fluoranthene	1.60E-06	AP-42	
		Fluorene	3.40E-06	AP-42	
		Indeno(1,2,3-cd)pyrene	8.70E-08	AP-42	
		Naphthalene	9.70E-05	AP-42	
		Perylene	5.20E-10	AP-42	
		Phenanthrene	7.00E-06	AP-42	
		Pyrene	3.70E-06	AP-42	
		Styrene	1.86E-03	AP-42	4.63
		Tetrachloroethane	3.10E-05	AP-42	0.08
		Toluene	9.20E-04	AP-42	2.29
		1.1.1-Tricloroethane	3.10E-05	AP-42	0.08
		Trichlorophenol	2.20E-08	AP-42	0.00
		Vinyl Chloride	1.00E-05	AP-42	0.02
		Xylene	2.50E-05	AP-42	0.06
		Total			**16.2**

Note: 1. AP-42, Table 1.6-3, 3/02, except where starred. For starred factors, individual e
from the Section 1.6 database (http://www.epa.gov/ttn/chief/ap42/ch01/related/c01s
were used that reflected stoker boiler equipped with wet scrubber.

Attachment 5

Updated Compliance with Applicable Rules and Regulations

This section replaces Part II, Compliance with Applicable Rules and Regulations, as provided in the original CSP application.

A. Covered Source Applicability

Section 1 (Definitions) of Subchapter 1 (General Requirements) of Chapter 11-60.1 (Air Pollution Control) of the State of Hawaii Administrative Rules defines a "covered source" as any of the following:

- Any "major source", which Section 1 further defines as a stationary source emitting at least 100 tpy of criteria pollutant, 10 tpy of any single hazardous air pollutant (HAP), or 25 tpy of all HAPs;
- Any source subject to a new source performance standard (NSPS) or other requirement under Section 111 of the Act;
- Any source subject to a national emissions standard for hazardous air pollutants (NESHAP) or other requirement pursuant to Section 112 of the Act, with the exception of those sources solely subject to regulations or requirements pursuant to Section 112(r) of the Act; and
- Any source subject to the rules for prevention of significant deterioration (PSD) of air quality as established in this chapter.

The HC&S Puunene Mill is a major source of criteria pollutants because maximum facility emissions exceed 100 tpy. The plant also will be a major source of HAPs because maximum facility HAP emissions, as shown previously, exceed 10 tpy for any single HAP and 25 tpy for all HAPs. Finally, Boiler 3 is subject to the NSPS that govern fossil fuel-fired steam generators with a heat input rate greater than 250 MMBTU/hr. Therefore, the Puunene Mill is a covered source.

Section 83 (Initial Covered Source Permit Application) of Subchapter 5 (Covered Sources) Chapter 11-60.1 requires that every application for a covered source permit include "a description of all applicable requirements and applicable test methods for determining the compliance status." "Applicable requirements" are defined in Section 81 (Definitions) as all of the following as they apply to emission units in a covered source:

1. Any standard or other requirement provided for in the state implementation plan (SIP) approved or promulgated by EPA;
2. Any term or condition of any preconstruction permit issued pursuant to regulations approved or promulgated through rulemaking pursuant to Title I, including Part C of the Act;
3. Any standard or other requirement approved pursuant to Section 111 of the Act, including Section 111(d);
4. Any standard or other requirement approved pursuant to Section 112 of the Act, including any requirement concerning accident prevention approved pursuant to Section 112(r)(7) of the Act;
5. Any requirement approved pursuant to Section 504(b) or 114(a)(3) of the Act;
6. Any standard or other requirement governing solid waste incineration approved pursuant to Section 129 of the Act;

7. Any standard or other requirement for consumer and commercial products, approved pursuant to Section 183(e) of the Act;
8. Any standard or other requirement for tank vessels approved pursuant to Section 183(f) of the Act;
9. Any standard or other requirement of the program to control air pollution from outer continental shelf sources approved pursuant to Section 328 of the Act;
10. Any standard or other requirement of the regulations promulgated to protect stratospheric ozone approved pursuant to Title VI of the Act, unless the Administrator has determined that such requirements need not be contained in a Title V permit;
11. Any NAAQS or increment or visibility requirement approved pursuant to Part C of Title I of the Act, but only as it would apply to temporary sources permitted pursuant to Section 504(e) of the Act;
12. Any NAAQS or state ambient air quality standard;
13. Any standard or other requirement approved pursuant to Title I, including Part C of the Act;
14. The application of best available control technology to control those pollutants subject to any NAAQS or state ambient air quality standard, but only as best available control technology would apply to new covered sources and significant modifications to covered sources that have the potential to emit or increase emissions above significant amounts considering any limitations, enforceable by the director, on the covered source to emit a pollutant; and
15. Any standard or other requirement provided for in chapter 342B, HRS; this chapter; or chapter 11-59.

Compliance with each of these requirements is discussed in the following sections.

B. Relevant Requirements That Are Not Applicable

Relevant requirements classified under the 15 elements identified above, which nonetheless are not applicable to the Puunene Mill sources, include the following, which are discussed below in greater detail:

- PSD Review
- Clean Air Mercury Rule
- 40 CFR 63, Subpart ZZZZ (National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines) (RICE)

1. PSD Review

Section 132 (Source Applicability) of Subchapter 4 (PSD Review) specifies that any new major stationary source or major modification to a major stationary source must undergo

PSD review on a pollutant-specific basis. This application is not proposing any major modifications as part of the CSP application, so PSD review is not required.

2. Clean Air Mercury Rule

The multi-fuel boilers at the Puunene mill are not subject to the Clean Air Mercury Rule (CAMR) because the boilers do not meet the applicability requirements specified in 40 CFR 60 Subparts Da or HHHH. The issue of applicability was discussed in detail in HC&S's letter to HDOH dated August 20, 2006, which is incorporated herein by reference.

3. 40 CFR 63, Subpart ZZZZ

The Puunene Mill is a major source of HAP emissions, as discussed in the previous section. Therefore, the requirements of 40 CFR 63, Subpart ZZZZ (National Emission Standards for Hazardous Air Pollutants for Stationary RICE) that promulgated on February 26, 2004, are potentially applicable. All of the RICE at the Puunene mill are smaller than 500 bhp. The version of the regulation that is currently in effect only applies to RICE "with a site-rating of more than 500 brake horsepower..."[1] Therefore, the requirements of the current regulation are not applicable to the facility.

Amendments to Subpart ZZZZ have been proposed that would apply to smaller engines, but these amendments have not been finalized or adopted. As currently proposed, the amendments would not include new emission standards that would be applicable to the HC&S RICE. HC&S will continue to monitor the regulation and its potential applicability to the existing RICE.

C. Applicable Requirements

Applicable requirements classified under the 15 elements identified above include the following:

- § 11-60.1-2 – Prohibition of Air Pollution;
- § 11-60.1-3 – General Conditions for Considering Applications;
- § 11-60.1-4 – Certification;
- § 11-60.1-6 – Holding of Permit;
- § 11-60.1-7 – Transfer of Permit;
- § 11-60.1-8 – Reporting Discontinuance;
- § 11-60.1-9 – Cancellation of a CSP;
- § 11-60.1-11 – Sampling, Testing, and Reporting;
- § 11-60.1-12 – Air Quality Models;
- § 11-60.1-13 – Operations of Monitoring Stations;
- § 11-60.1-15 – Reporting of Equipment Shutdown;
- § 11-60.1-16 – Prompt Reporting of Deviations;
- § 11-60.1-16.5 – Emergency Provisions;
- § 11-60.1-17 – Prevention of Air Pollution Emergency Episodes;

[1] 40 CFR 63.6590 (a)

- § 11-60.1-18 – Variances;
- § 11-60.1-32 – Visible Emissions;
- § 11-60.1-33 – Fugitive Dust;
- § 11-60.1-34 – Motor Vehicles;
- § 11-60.1-37 – Process Industries;
- § 11-60.1-38 – Sulfur Oxides from Fuel Combustion;
- § 11-60.1-39 – Storage of VOCs;
- § 11-60.1-41 – Pump and Compressor Requirements;
- § 11-60.1-82 – Covered Source Permit Applicability;
- § 11-60.1-83 – Initial CSP Application;
- § 11-60.1-85 – Compliance Plan;
- § 11-60.1-86 – Compliance Certification of Covered Sources;
- 40 CFR Part 60, Subparts A and D – New Source Performance Standards;
- 40 CFR Part 63, Subpart DDDDD – National Emission Standards for Hazardous Air Pollutants; and Subpart A – General Provisions
- Ambient Air Quality Standards.

Compliance with Sections 6, 7, 8, 9, 11, 13, 15, 16, 16.5, 17, 18, 33, 34, 37, 38, 39 and 41 was demonstrated in the original CSP application; that discussion is incorporated herein by reference. The remaining applicable requirements are discussed below.

1. State Regulations

a. §11-60.1-82 – Covered Source Permit Applicability

Section 82 of Chapter 60.1 prohibits a covered source from commencing construction without first obtaining a CSP and requires an existing source to submit an initial application for a CSP in accordance with specified dates. HC&S submitted its original CSP application in accordance with the requirements of Section 82.

b. §11-60.1-83 – Initial CSP Application

Section 83 of Chapter 60.1 identifies all items that must be submitted in an initial CSP application and requires the applicant to provide additional information as requested by the Department. The original CSP application was submitted in accordance with the requirements of Section 83, and HC&S has provided additional information requested by the Department in a timely manner.

c. §11-60.1-85 – Compliance Plan

Section 85 of Chapter 60.1 requires the submission of a compliance plan with each CSP application. The compliance plan must identify applicable requirements and state that the source will comply with these requirements in the future. The original CSP application included a compliance plan, and this revised CSP application includes an updated compliance plan in accordance with the requirements of Section 85.

d. §11-60.1-86 – Compliance Certification of Covered Sources

Section 83 of Chapter 60.1 requires the submission of a compliance certification with each CSP application. The compliance certification must describe the methods used to determine compliance. The original CSP application included the required compliance certification, and this revised CSP application includes an updated compliance certification in accordance with the requirements of Section 86.

2. New Source Performance Standards: 40 CFR Part 60, Subparts A and D

Section 161 of Chapter 60.1 incorporates, by reference, the federal NSPS. Title 40 CFR Part 60 Subpart D contains the applicable NSPS for fossil fuel-fired steam generators for which construction is commenced after August 17, 1971. Construction of Boiler 3 commenced on or about April 3, 1973. HC&S notified HDOH that Boiler 3 is subject to the requirements of Subparts A (General Provisions) and D on September 19, 2001. Compliance with the requirements of the NSPS is discussed in more detail in the following sections.

Construction of Boilers 1 and 2 commenced prior to August 17, 1971, before the applicability date of Subpart D.

3. National Emission Standards for Hazardous Air Pollutants: 40 CFR 63 Subpart DDDDD

Subchapter 9 regulates the emissions of hazardous air pollutants (HAPs), as defined, from stationary sources. Section 11-60.1-174 incorporates by reference the requirements of 40 CFR Part 63, which apply to major sources of HAPs. HC&S has determined that the Puunene Mill boilers are a major source of HAPs, and therefore the facility is subject to MACT requirements. The applicable MACT requirement is Subpart DDDDD, Industrial, Commercial and Institutional Boilers. HC&S submitted the initial notification required under 40 CFR Section 63.9(b) to HDOH and EPA Region 9 on October 13, 2006. Compliance with the requirements of Subpart DDDDD is discussed in detail in the following sections.

4. Consent Order

On December 8, 2006, HC&S entered into a consent order with the Department to settle allegations that Puunene Mill Boiler 3 was not operated in compliance with the requirements of 40 CFR Part 60 Subpart D. The consent order requires HC&S to undertake the following:

a. Within 180 days of the effective date of the consent order, commence implementation of a two-phase Supplemental Environmental Project (SEP). The SEP includes Phase I, an alternative opacity monitoring program for Boilers 1 and 2; and Phase 2, an improved bagasse delivery system for the Puunene boilers; and

b. Within 120 days of the effective date of the consent order, submit an application or revision of the pending CSP application to HDOH, incorporating the Phase I monitoring requirements of the consent order; use its best efforts to submit a CSP application or revision that complies with these monitoring requirements and submit any additional information requested by HDOH in a timely manner; and secure all required operating permits.

This CSP application is submitted in accordance with the requirements of the consent order. The Phase I alternative opacity monitoring requirements are discussed further in the monitoring section below.

5. Ambient Air Quality Standards

Section 83(12) of Chapter 60.1 requires an assessment of the impact of emissions from a new covered source upon ambient air quality. An ambient air quality impact analysis was prepared using AERMOD and representative meteorological data. The analysis indicates that emissions from the Puunene mill will not cause or contribute to an exceedance of any ambient air quality standard. The ambient air quality analysis was submitted to HDOH on December 10, 2004, and is incorporated herein by reference.

As discussed in Attachment 3, HC&S is proposing to eliminate #6 fuel oil and to increase allowable annual use of specification used oil in the boilers. These changes result in a large net reduction in SO_2 potential to emit for Boilers 1 and 2. The ambient air quality impact analysis for SO_2 has been revised to reflect the new, lower potential to emit. The results of the ambient air quality analysis are presented in Attachment 6.

D. Monitoring and Recordkeeping Requirements

The following monitoring and recordkeeping requirements are proposed to demonstrate compliance with the applicable requirements listed above.

1. Compliance with Fuel Use and Production Limits

   - Monitor and record fuel type and consumption on a daily basis for Boilers 1 and 2 (combined) and for Boiler 3.
   - Monitor and record specification used oil parameters and specification used oil use on a monthly basis.
   - Monitor and record cooking oil use on a monthly basis.
   - Monitor and record sugar throughput through the sugar dryer on a monthly and annual basis.
   - Maintain the following records for each shipment of coal:
     - Name of supplier;
     - Location where coal originated;
     - Type of coal;
     - Whether coal is washed or unwashed;
     - Quantity of coal in shipment;
     - Date shipment received;
     - Date of sample and date of test; and
     - Coal heating value and sulfur content.

2. Compliance with Visible Emission Limits in HAR 11-60.1-32

   - Conduct monthly and annual visible emissions observations on Boilers 1 and 2 exhaust stacks and on Boiler 3 exhaust stack in accordance with Method 9.

3. Compliance with the December 8, 2006, Consent Order

   - No later than June 6, 2007, commence implementation of the Phase I alternative opacity monitoring, notification and recordkeeping procedure for Boilers 1 and 2, in accordance with Exhibits A through E to the Consent Order, or any subsequent alternative opacity monitoring plan that is submitted to and approved by HDOH that supersedes the alternative opacity monitoring, notification and recordkeeping procedure in Exhibits A through E. The *Procedure for Meeting Alternative Opacity Monitoring, Notification, and Recordkeeping Requirements – Puunene Boilers 1, 2, and 3* attached to this permit application is intended to meet this requirement of the Consent Order.

   - No later than June 6, 2007, commence implementation of the Phase II improved bagasse delivery system for the boilers, in accordance with Exhibit B to the Consent Order.

4. Compliance with 40 CFR Part 60 Subpart D

   - Upon approval by HDOH, implement the Boiler 3 fuel sulfur analysis (FSA) procedure for fuel oil that was submitted to HDOH on April 8, 2003 (which is incorporated by reference into this permit application), or any subsequent FSA procedure for fuel oil that is submitted to and approved by HDOH that supersedes the existing fuel oil FSA procedure. The fuel oil FSA procedure will be used to monitor compliance with limits on sulfur dioxide emissions from fuel oil under Subpart D in lieu of installing a CEMS for sulfur dioxide, as permitted under 40 CFR Section 60.45(b)(2). Upon receipt of approval to fire specification used oil fuel in Boiler 3, the fuel oil FSA procedure will be revised to include monitoring of sulfur in used oil.

   - Upon approval by HDOH, implement the Boiler 3 FSA procedure for coal that was submitted to HDOH on July 1, 2005, as modified on September 14, 2005 to allow manual rather than automatic processing of coal samples (which is incorporated by reference into this permit application), or any subsequent FSA procedure for fuel oil that is submitted to and approved by HDOH that supersedes the existing coal FSA procedure. The coal FSA procedure will be used to monitor compliance with limits on sulfur dioxide emissions from coal under Subpart D in lieu of installing a CEMS for sulfur dioxide, as permitted under 40 CFR Section 60.45(b)(2).

   - Implement the Boiler 3 alternative opacity monitoring, notification and recordkeeping procedure attached to this application, or any subsequent alternative opacity monitoring procedure that is submitted to and approved by HDOH that supersedes the attached alternative opacity monitoring procedure.

   - Operate the Boiler 3 wet scrubber in accordance with the minimum flows and differential pressures provided in the Boiler 3 alternative opacity monitoring, notification and recordkeeping procedure attached to this application, or any subsequent set of wet scrubber operating conditions that is submitted to and approved by HDOH that supersedes the attached set of operating conditions.

- In conjunction with any required performance testing, demonstrate that nitrogen oxides emissions during coal or oil firing in Boiler 3 are no more than 70% of the respective emissions limits under 40 CFR Section 60.44. This demonstration will be made in lieu of installing a CEMS for nitrogen oxides, as permitted under 40 CFR Section 60.45(b)(3). In the event that any performance testing conducted during coal or oil firing in Boiler 3 demonstrates that nitrogen oxides emissions during coal or oil firing are greater than 70% of the emissions limit specified in 40 CFR §60.44, within one year of completion of the test, install, certify and operate CEMS for monitoring NOx and either O_2 or CO_2.
- At least 30 days prior to the installation of a CEMS that is required to be installed on Boiler 3, submit to HDOH plans and specifications for the system and a quality assurance/quality control plan that meets the requirements of 40 CFR Part 60, Subparts B and F.

5. Compliance with 40 CFR Part 63, Subpart DDDDD

- Develop and implement a site-specific monitoring plan in accordance with the requirements of §63.7505(d). The site-specific monitoring plan must include: performance and equipment specifications and performance and acceptance criteria for any required parametric monitoring system; ongoing operation and maintenance procedures (in accordance with the requirements of §63.8(c)(1), (c)(3) and (c)(4)(ii)); ongoing data quality assurance procedures (in accordance with the requirements of §63.8(d); and ongoing recordkeeping and reporting procedures (in accordance with the requirements of §63.10(c), (e)(1) and (e)(2)(i).
- Develop and implement a startup, shutdown and malfunction plan in accordance with the requirements of §63.6(e)(3) and §63.7521(e).
- Maintain records in accordance with the requirements of §63.7555.
- If compliance with Subpart DDDDD emission limits is demonstrated by performance testing, install, operate and maintain a parametric monitoring system to ensure the operation of the boiler wet scrubbers in compliance with the applicable operating limits of §63.7500.

E. Testing Requirements

The following testing requirements reflect those necessary to demonstrate compliance with the applicable requirements listed above.

1. Compliance with Emissions Limitations

- Perform annual emissions testing using EPA-approved test methods to demonstrate compliance with the following emissions limits:
  - Boilers 1 and 2: Coal - NOx and PM; Bagasse - PM
  - Boiler 3: Coal - NOx, PM and SO_2; Bagasse - PM; Fuel Oil - NOx, SO_2 and PM.
- These annual testing requirements may be waived by HDOH.

2. Compliance with 40 CFR Part 63, Subpart DDDDD

- Develop and implement a fuel analysis plan in accordance with the requirements of §63.7521(b).
- Conduct initial performance tests and establish operating limits for the boiler wet scrubbers in accordance with the requirements of §63.7520 and §63.7530(c).
- Conduct subsequent performance tests in accordance with the requirements of §63.7515.
- Conduct a fuel analysis for each type of fuel burned every 5 years or when a new fuel type is burned, in accordance with the requirements of §63.7515(f)

F. Notification and Reporting Requirements

The following notification and reporting requirements would provide the information necessary for HDOH to verify compliance with applicable requirements.

1. Compliance with Fuel Use and Production Limits

- Submit the required annual emissions report and fee form.
- Notify the Department in writing at least 30 days in advance of conducting a source performance test.
- Submit the source performance test report within 60 days of completing the test program.
- Submit semiannual reports of the quantities of the following fuels used in each boiler:
  - Specification used oil
  - Cooking oil
  - Coal
  - Fuel oil
  - Bagasse
  - Wood Chips
  - Other biomass
- Submit semiannual reports of the quantities of throughput for the sugar dryer

2. Compliance with the Visible Emission Limits in HAR 11-60.1-32

- Report semiannually regarding opacity exceedances determined by the required visible emissions monitoring

3. Compliance with the December 8, 2006, Consent Order

   - Submit the semiannual reports required by Section F of Attachment A to the Consent Order

4. Compliance with 40 CFR Part 60 Subpart D

   - Submit semiannual reports of excess emissions from Boiler 3, in accordance with the requirements of 40 CFR 60.7(c)

5. Compliance with 40 CFR 63 Subpart DDDDD

   - Submit an initial notification of applicability in accordance with the requirements of §63.7545(b)
   - Submit the site-specific fuel analysis plan at least 60 days before demonstrating compliance through a fuel analysis, in accordance with the requirements of §63.7521(b)
   - Submit notification of intent to conduct a performance test and submit a quality assurance and test plan at least 30 days before the performance test is scheduled to begin, in accordance with the requirements of §63.7545(d)
   - Submit a notification of compliance status, including performance test results and/or fuel analysis results, within 60 days after completing the tests but no later than May 11, 2008, in accordance with the requirements of §63.7545(e)
   - Submit semiannual compliance reports in accordance with the requirements of §63.7550(b)

Attachment 6

Updated Ambient Air Quality Impacts Analysis

Many revised ambient air quality impacts analyses have been prepared and submitted for the Puunene mill since the 1994 covered source permit application was submitted. The most recent analysis, submitted on December 10, 2004, reflects compliance with current regulatory requirements and with the current physical configuration of the boiler stacks. The December 2004 analysis was also prepared using the EPA's current guideline model, AERMOD, and meteorological data collected at Puunene by HC&S.

In this application, HC&S has proposed to eliminate the use of #6 fuel oil in Boilers 1 and 2. As discussed in Attachments 3 and 4 to this application, this change in allowable fuels will reduce the potential to emit sulfur oxides from Boilers 1 and 2. The SO_2 modeling analysis has been revised to reflect the new, lower SO_2 emission rate for these boilers. As in the December 2004 analysis, the AERMOD model and Puunene meteorological data were used. The maximum modeled concentrations are summarized in the table below.

HC&S Puunene Mill Boilers
Maximum Modeled Concentrations, µg/m³, by Pollutant and Averaging Period

	NO_2	SO_2			CO		PM_{10}	
	Annual*	3-hr	24-hr	Annual	1-hr	8-hr	24-hr	Annual
Puunene Mill Boilers	12.4	750	155	15	5,909	1,309	30.7	5.8
State Standard	100	1,300	365	80	10,000	5,000	150	50
Federal Standard	100	1,300	365	80	40,000	10,000	35	12

Note: * NOx adjusted to NO_2 using Ambient Ratio Method (ARM) and national default conversion factor of 0.75.

The modeling files for NOx, CO and PM_{10} impacts were submitted in December 2004 and are incorporated by reference. The new modeling files for SO_2 are provided on CD. The meteorological data have previously been submitted with a request for confidential treatment.

Attachment 7

Summary of Revisions to CSP Application

Summary of Revisions – Covered Source Permit Application No. 0054-01-C
Hawaiian Commercial and Sugar Company Puunene Sugar Mill

Subject	Date	Revision	Reason for Request	Justification or Verification of Compliance with HAR 11-60.1 and NSPS	Remarks
Initial Covered Source Permit Application	5/25/1994	None	Initial CSP application	Required by HAR 11-60.1	-
Response to request for additional information	9/9/1994 9/28/1994	- Provide details regarding monitoring of heat input to boilers (since revised) - Provide details regarding potential emissions and revised air quality impact analysis - Provide details regarding control of fugitive dust from coal and bagasse piles (including fugitive emissions control plan for coal handling and storage)	Response to DOH request for additional information	- Information requested by DOH - Fugitive emissions controls comply with HAR 11-60.1-33	-

Summary of Revisions – Covered Source Permit Application No. 0054-01-C
Hawaiian Commercial and Sugar Company Puunene Sugar Mill

Subject	Date	Revision	Reason for Request	Justification or Verification of Compliance with HAR 11-60.1 and NSPS	Remarks
Boiler 1 and 2 particulate matter emission limit for coal	1/17/1995	Change PM emissions limit for coal firing in Boilers 1 and 2 to: 0.24 lb PM/MMBTU from: 0.114 lb PM/MMBTU)	Stack testing demonstrated that the PM emission limit assigned by DOH in the ATC could not be consistently met by the boilers during coal firing	- PM emission limit was set arbitrarily by DOH in the ATC for coal based on predicted boiler performance; actual boiler performance was not as predicted - State and federal regulations do not establish any emission limits during coal firing for these boilers - Modeling demonstrates that higher PM emission limit requested would not result in violation of AAQS - EPA provided a letter to DOH (dated January 19, 1999) recommending that DOH proceed with administratively revising the emission limit as requested	-
1.0 MMBTU/hr BAYCO heat cleaning oven	5/10/1995	Request for determination that 1.0 MMBTU/hr LPG-fired heat cleaning oven is an insignificant activity	Heat cleaning oven was listed in the initial CSP application as an insignificant activity but was not yet operational; a determination that the oven is an insignificant activity is necessary in order to place the unit into service	- Annual emissions from the equipment will be less than one ton per year of any air pollutant - Effective heat input capacity of unit is only 625 MMBTU/hr due to cycling of primary burner - Oven is an insignificant activity under HAR 11-60.1-82(f)(7)	DOH approval 5/24/1995
Portable diesel-fired irrigation pumps	8/7/1995	Include three portable diesel-fired irrigation pumps as insignificant activities in CSP	Pumps were not included in the initial CSP application; DOH advised to include them as insignificant activities	- Insignificant activity per HAR 11-60.1-82(f)(2) and/or (f)(7)	Subsequently deleted from CSP as part of HC&S "farm facility"

Summary of Revisions – Covered Source Permit Application No. 0054-01-C
Hawaiian Commercial and Sugar Company Puunene Sugar Mill

Subject	Date	Revision	Reason for Request	Justification or Verification of Compliance with HAR 11-60.1 and NSPS	Remarks
Solid fuel storage piles	12/22/1995	Revise description of bagasse and coal storage areas and increase allowable height of piles from 15 to 20 feet	Provide greater flexibility with respect to storage of solid fuels	Change to fuel storage areas would not result in any increase in fugitive emissions from storage piles and complies with HAR 11-60.1-33	-
Petroleum storage tanks	12/22/1995	Update list of petroleum storage tanks	Update CSP application to reflect existing petroleum storage tank locations and capacity	- Descriptions and locations of petroleum storage tanks in initial CSP application needed to be updated; no change in applicable requirements or emissions would result - All petroleum storage tanks added to the CSP are insignificant activities under HAR 11-60.1-82(f)(1)	-
Boiler 3 coal consumption limits	12/22/1995	Revise limitations on amount of coal fired in Boiler 3 to allow up to 50% of annual heat input from the boiler to come from coal, remove tons per year coal limit	Provide greater flexibility with respect to coal firing in Boiler 3	Original ATC/PTO for coal firing in Boiler 3 limited annual coal consumption to 35% of total heat input to the boiler and 45,000 tons per year; these limits were assigned arbitrarily by DOH based on HC&S estimates of expected coal use and have no basis in either state or federal regulations	-

Summary of Revisions – Covered Source Permit Application No. 0054-01-C
Hawaiian Commercial and Sugar Company Puunene Sugar Mill

Subject	Date	Revision	Reason for Request	Justification or Verification of Compliance with HAR 11-60.1 and NSPS	Remarks
Boilers 1 and 2 nitrogen oxides emission limit for coal	12/22/1995	Change NOx emissions limit for coal firing in Boilers 1 and 2 to: 0.65 lb NOx/MMBTU from: 0.58 lb PM/MMBTU)	Stack testing demonstrated that the NOx emission limit assigned by DOH in the ATC could not be consistently met by the boilers during coal firing	- NOx emission limit for Boilers 1 and 2 on coal was set arbitrarily by DOH in the ATC for coal based on predicted boiler performance; actual boiler performance was not as predicted - State and federal regulations do not establish any emission limits during coal firing applicable to these boilers; proposed NOx emission limit is less than the NSPS emission limit for larger and newer boilers (e.g., Boiler 3) - Modeling demonstrated that higher NOx emission limit requested would not result in violation of AAQS - EPA provided a letter to DOH (dated January 19, 1999) recommending that DOH proceed with administratively revising the emission limit as requested	-
910,000 BTU/hr Bock water heater at HARC Experiment Station	3/5/1996	Add diesel-fired Bock water heater rated at 910,000 BTU/hr to the CSP	Water heater previously owned/operated by HARC was not part of the initial CSP application, but will now be operated by HC&S	Water heater is an insignificant activity under HAR 11-60.1-82(f)(2)	This water heater subsequently replaced with a new LPG-fired unit

Summary of Revisions – Covered Source Permit Application No. 0054-01-C
Hawaiian Commercial and Sugar Company Puunene Sugar Mill

Subject	Date	Revision	Reason for Request	Justification or Verification of Compliance with HAR 11-60.1 and NSPS	Remarks
Specification used oil fuel usage	3/13/1996	Change specification used oil fuel limit requested in initial CSP application from 5% to 10% of total fuel oil consumption (up to an estimated 650,000 gallons per year)	Allow greater flexibility with respect to firing of used oil and make Puunene and Paia Mill permits consistent	- Regardless of the quantity of specification used oil fuel fired, used oil combustion would comply with state requirements - Specification used oil fuel is regulated as virgin fuel oil at the federal level	HC&S has since requested that limits on specification used oil combustion be based on total gallons fired annually rather than as a percentage of total fuel oil fired
Submittal of stack test reports	6/13/1996	Require that stack test reports be submitted to DOH within 60 days of completion of testing rather than within 30 days, as currently required	The present 30 day time limit provides insufficient time to complete lab analyses, compile data, and prepare the reports	State and federal regulations do not specify a time period for submitting stack test reports	-
Coal fugitive dust control plan	8/29/1996	Modify existing coal fugitive dust control plan	Revisions reflect low potential for fugitive dust emissions during handling and storage of washed coal and incorporate Boiler 1 and 2 coal handling equipment in the plan	Revised plan complies with HAR 11-60.1-33 requirements for control of fugitive dust	-
New lime slaker	9/26/1996 3/21/1997 4/2/1997	Request for determination that proposed new lime slaker is an insignificant activity	Lime slaker is needed to provide hydrated lime to the sugar manufacturing process, since the present lime vendor will no longer be supplying hydrated lime	- Particulate matter emissions from the proposed lime slaker will be less than one ton per year - Proposed lime slaker is an insignificant activity under HAR 11-60.1-82(f)(7)	DOH approval 4/4/1997

Summary of Revisions – Covered Source Permit Application No. 0054-01-C
Hawaiian Commercial and Sugar Company Puunene Sugar Mill

Subject	Date	Revision	Reason for Request	Justification or Verification of Compliance with HAR 11-60.1 and NSPS	Remarks
Boiler 3 particulate matter emission limit for coal	11/6/1996	Change PM emissions limit for coal firing in Boiler 3 to: 0.20 lb PM/MMBTU from: 0.85 lb PM/MMBTU)	- Responding to DOH request 9/20/1996 - Reduce annual emissions fees which, at the time, were to be based on allowable rather than actual emissions	The lower emission limit requested is permissible under state and federal regulations	Boiler 3 PM emission limit during coal firing is now 0.1 lb PM/MMBTU, pursuant to applicable NSPS
Bagasse particulate matter emission limit for all boilers	12/31/1996	Change PM emissions limit for bagasse firing in all Boilers to: 0.47 lb PM/MMBTU from: 0.4 lb PM/100 lb fuel	Reduce annual emissions fees which, at the time, were to be based on allowable rather than actual emissions	The lower emission limits requested are permissible under state and federal regulations	This request for lower emissions limits has been withdrawn
Fuel oil sulfur limits for all boilers	12/31/1996	Change fuel oil sulfur limits to maximum of 2.0 % for fuel oil #6 and 0.5 % for diesel fuel and specification used oil fuel	Reduce annual emissions fees which, at the time, were based on allowable rather than actual emissions	The lower emission limits requested are permissible under state and federal regulations	This request for lower emissions limits has been withdrawn
Boiler 3 oil burners	3/5/1997	Revise Table 2 of the initial CSP application to reflect replacement of oil burners	Boiler 3 oil burners were replaced	Periodic replacement of oil burners is routine in oil-fired boilers due to normal wear and tear and is therefore not a modification; rating of new burners is identical to old burners	-

Summary of Revisions – Covered Source Permit Application No. 0054-01-C
Hawaiian Commercial and Sugar Company Puunene Sugar Mill

Subject	Date	Revision	Reason for Request	Justification or Verification of Compliance with HAR 11-60.1 and NSPS	Remarks
Portable diesel-fired irrigation pumps	4/21/1997 5/12/1997	- Delete portable diesel-fired irrigation pumps from CSP - Request determination that pumps are exempt from non-covered source permit requirement	Portable diesel-fired irrigation pumps formerly listed as insignificant activities in the Paia and Puunene Mill CSP applications are located in nearby sugarcane fields and are part of the HC&S agricultural operations rather than the sugar mill operations	Exempt from noncovered source permitting requirement under HAR 11-60.1-62(d)(4)	DOH approved July 7, 1997
Boilers 1 and 2 emission limits for coal	8/8/1997	Revision of PM and NOx emission limits during coal firing in Boilers 1 and 2	Stack testing demonstrated that the PM and NOx emission limits arbitrarily assigned by DOH in the ATC could not be consistently met by the boilers during coal firing	- PM and NOx emission limits for Boilers 1 and 2 on coal were set arbitrarily by DOH in the ATC for coal based on predicted boiler performance; actual boiler performance was not as predicted - State and federal regulations do not establish any emission limits during coal firing applicable to these boilers, nor were the emission limits set based on any BACT or other new source review-related evaluation - Modeling demonstrates that higher emission limits requested would not result in violation of AAQS - EPA provided a letter to DOH (dated January 19, 1999) recommending that DOH proceed with administratively revising the emission limit as requested	-

Summary of Revisions – Covered Source Permit Application No. 0054-01-C
Hawaiian Commercial and Sugar Company Puunene Sugar Mill

Subject	Date	Revision	Reason for Request	Justification or Verification of Compliance with HAR 11-60.1 and NSPS	Remarks
Boiler 3 coal consumption limits	8/8/1997	- Increase annual heat input limit for coal in Boiler 3 from 35% to 50% - Retain existing (and more limiting) 45,000 tons per year limit on coal firing in Boiler 3	Provide greater flexibility with respect to coal firing in Boiler 3	- Original ATC/PTO for coal firing in Boiler 3 limited annual coal consumption to 35% of total heat input to the boiler and 45,000 tons per year; these limits were assigned arbitrarily by DOH and have no basis in either state or federal regulations - Because the 45,000 tons per year limit would remain in place, revising the annual heat input limit would have no impact on boiler emissions - EPA letter dated January 19, 1999 regarding correction of erroneous emissions limits or other restrictions should allow administrative revision	-
Unwashed coal	8/28/1997	Change initial CSP application to allow continued acceptance of both washed and unwashed coal	Because only washed coal had ever been burned at the facility, the initial CSP application did not include acceptance of unwashed coal; the change is requested to maintain existing flexibility regarding coal suppliers	The existing PTO/ATC for the facility allow both washed and unwashed coal to be burned; the request merely asks that this condition be extended when the CSP is issued	-

Summary of Revisions – Covered Source Permit Application No. 0054-01-C
Hawaiian Commercial and Sugar Company Puunene Sugar Mill

Subject	Date	Revision	Reason for Request	Justification or Verification of Compliance with HAR 11-60.1 and NSPS	Remarks
Boiler 1 and 2 emission limits for coal	9/16/1997 (fax)	Revision of PM and NOx emission limits during coal firing in Boilers 1 and 2 (response to DOH questions raised during meeting 8/21/1997 regarding whether existing limits were based on BACT review)	Stack testing demonstrated that the PM and NOx emission limits arbitrarily assigned by DOH in the ATC could not be consistently met by the boilers during coal firing	- DOH previously determined that addition of coal as an allowable fuel for Boilers 1 and 2 was not considered a modification under state or federal regulations if the boilers were already capable of accommodating coal as a fuel; no BACT review was therefore required - Requested emission changes are not modifications triggering BACT review under state regulations	-
Bagasse particulate matter emission limit for all boilers	1/8/1998	Retain existing permit limits for PM from bagasse in all boilers in CSP	Maintain existing flexibility with respect to facility emissions; DOH revised its rules so that annual emissions fees are to be based upon actual rather than allowable emissions, removing the impetus for the lower emissions limits previously requested	Request would simply retain existing emission limits	-
Boiler 3 particulate matter emission limit for coal	1/8/1998	Retain existing permit limit for PM from coal in Boiler 3 in CSP	Maintain existing flexibility with respect to facility emissions; DOH revised its rules so that annual emissions fees are to be based upon actual rather than allowable emissions, removing the impetus for the lower emissions limits previously requested	Request would simply retain existing emission limits	Boiler 3 PM emission limit during coal firing is now 0.1 lb PM/MMBTU, pursuant to applicable NSPS

Summary of Revisions – Covered Source Permit Application No. 0054-01-C
Hawaiian Commercial and Sugar Company Puunene Sugar Mill

Subject	Date	Revision	Reason for Request	Justification or Verification of Compliance with HAR 11-60.1 and NSPS	Remarks
Propane startup fuel	6/15/1998 6/26/2000	Add propane to list of permitted fuels	Propane is used as a startup fuel in all Puunene boilers; because the boilers are operated on this fuel only during start-up, it was not listed as a permitted fuel in the original CSP application	- All fuels fired in the boilers are required to be included in the CSP - Propane is an existing fuel used during startup of the boilers only; due to the small quantity of propane fired, annual emissions from propane combustion are negligible - Maximum potential to emit for propane igniters (used to fire propane during boiler startup) on all three boilers is less than one ton per year for all criteria pollutants	-
700,000 BTU/hr Hotsy hot water pressure washer at Cane Truck Shop	7/13/1998	Add a diesel-fired hot water pressure washer rated at 700,000 BTU/hr to the CSP	CSP is required to list insignificant activities	Pressure washer is an insignificant activity under HAR 11-60.1-82(f)(2)	This equipment is no longer in use and can be deleted from the CSP
Boiler 1 and 2 emission limits for coal (memo to EPA Region IX, copy to DOH)	9/21/1998	- Revision of PM and NOx emission limits during coal firing in Boilers 1 and 2 - Request concurrence of EPA that existing permit limits should be regarded as errors and can be changed administratively	Stack testing demonstrated that the PM and NOx emission limits arbitrarily assigned by DOH in the ATC could not be consistently met by the boilers during coal firing	- Existing permit limits were imposed based on less than adequate supporting data and not as a result of a BACT or other new source review-related evaluation - Proposed changes will not cause or contribute to a violation of AAQS or PSD increments	-

Summary of Revisions – Covered Source Permit Application No. 0054-01-C
Hawaiian Commercial and Sugar Company Puunene Sugar Mill

Subject	Date	Revision	Reason for Request	Justification or Verification of Compliance with HAR 11-60.1 and NSPS	Remarks
Boiler 1 and 2 emission limits for coal (letter from EPA Region IX to DOH, copy to HC&S)	1/19/1999	Recommend administrative revision to Boiler 1 and 2 coal emission limits as requested	Stack testing demonstrated that the PM and NOx emission limits arbitrarily assigned by DOH in the ATC could not be consistently met by the boilers during coal firing	- When a permitting agency has made a mistake in applying an emission limit or other restriction to a source, the permitting agency may administratively revise the limit without triggering PSD review - The permitting agency would be retroactively applying the correct emission limit and not actually applying a new emission limits	EPA letter
Additional fiber crops as boiler fuels	8/5/1999	Add banna grass, other fiber crops as permitted fuels in CSP	Provide additional flexibility regarding combustion of environmentally friendly, greenhouse-neutral biomass fuels	- Emissions from firing banna grass and other herbaceous crops are not expected to differ from emissions from firing bagasse - Addition of new biomass fuels is not a modification because the boilers were capable of firing these fuels when they were constructed	-
Wood chips as boiler fuel	8/5/1999 6/26/2000	Add untreated wood chips as permitted fuel in CSP	Provide additional flexibility regarding combustion of environmentally friendly, greenhouse-neutral biomass fuels	- With the possible exception of carbon monoxide emissions, emissions from firing wood chips are expected to be no higher than emissions from firing bagasse - Carbon monoxide emissions from firing wood chips will not cause or contribute to violation of AAQS - Addition of new biomass fuels is not a modification because the boilers were capable of firing these fuels when they were constructed	Recent stack testing shows CO emissions during bagasse firing in all Puunene boilers have exceeded estimated CO emissions from wood firing (1.5 lb/MMBTU)

Summary of Revisions – Covered Source Permit Application No. 0054-01-C
Hawaiian Commercial and Sugar Company Puunene Sugar Mill

Subject	Date	Revision	Reason for Request	Justification or Verification of Compliance with HAR 11-60.1 and NSPS	Remarks
Molasses as boiler fuel	8/5/1999 6/26/2000	Add molasses as permitted fuel in CSP	Provide additional flexibility regarding boiler fuel selection, provide an alternative means for disposal of excess molasses	Addition of new biomass fuels is not a modification because the boilers were capable of firing these fuels when they were constructed	Request withdrawn due to lack of available emissions data
Wood-fired curing of boiler refractory	8/5/1999	Allow wood combustion in the boilers during shutdown for curing of replaced refractory	Curing of replacement refractory materials is necessary prior to boiler startup and requires elevated temperatures inside the furnace	Annual emissions from wood fires for refractory curing are substantially less than one ton for any pollutant; this maintenance activity is therefore an insignificant activity under HAR 11-60.1-82(f)(7)	A similar determination was requested 3/24/1999 and again 5/1/2001 for Paia Mill; DOH approval was finally granted for this activity at Paia Mill 5/4/2001
558,000 BTU/hr Landa water heater at Tractor Shed	9/1/1999	Add new diesel-fired Landa water heater rated at 558,000 BTU/hr to the CSP; delete existing Hotsy water heater at Tractor Shed from CSP	Replacement of old water heater with new water heater	New water heater is an insignificant activity under HAR 11-60.1-82(f)(2)	-

Summary of Revisions – Covered Source Permit Application No. 0054-01-C
Hawaiian Commercial and Sugar Company Puunene Sugar Mill

Subject	Date	Revision	Reason for Request	Justification or Verification of Compliance with HAR 11-60.1 and NSPS	Remarks
Specification used oil fuel	10/26/1999	Request to modify existing permits to operate to allow combustion of up to 250,000 gallons per year of specification used oil fuel (pending issuance of CSP)	Per discussions with Clean Air Branch staff, minor modification to existing PTO would expedite burning of used oil fuel at Puunene while awaiting issuance of CSP	- Regardless of the quantity of specification used oil fuel fired, used oil combustion would comply with state requirements - Specification used oil fuel is regulated as virgin fuel oil at the federal level - Boilers were capable of firing used oil fuel when constructed, so fuel switch is not a modification - Increase in emissions from used oil combustion would not exceed significance levels	No response to this request was ever provided
Increase Boiler 3 stack height	11/15/1999 8/30/2004	Increase the height of the Boiler 3 stack from 120 to 140 feet	Stack height increase is needed to eliminate modeled violations of short-term SO2 AAQS	Increase in stack height will eliminate modeled violations of 3-hour and 24-hour SO2 AAQS during fuel oil #6 firing	Stack height increase has been approved and completed
Standby generators during annual maintenance power outage	11/15/1999	Operate standby diesel generators and other portable diesel or gasoline fired industrial equipment for a three-week period during maintenance outage	Equipment needed to conduct maintenance and maintain power to essential operations during plant-wide power outage	- Diesel generators are insignificant activities under HAR 11-60.1-82(f)(7) - Emissions from diesel generators are below PSD significance levels	Approved by DOH 12/17/1999; revised determination made 12/20/2001 after 2001 revision to HAR 11-60.1

Summary of Revisions – Covered Source Permit Application No. 0054-01-C
Hawaiian Commercial and Sugar Company Puunene Sugar Mill

Subject	Date	Revision	Reason for Request	Justification or Verification of Compliance with HAR 11-60.1 and NSPS	Remarks
Food grade sugar dryer	11/15/1999	Request to approve installation of 20,000 lb/hr rotary sugar dryer as an insignificant activity	Sugar dryer is needed to improve the quality of food-grade specialty sugars	PM-10 emissions from the sugar dryer will be less than one ton per year; dryer is therefore an insignificant activity under HAR 11-60.1-82(f)(7)	DOH determined that dryer is not an insignificant activity, requires permit
Food grade sugar dryer	1/14/2000	Request to modify existing permit to operate to allow installation of 20,000 lb/hr rotary sugar dryer	- Sugar dryer is needed to improve the quality of food-grade specialty sugars - Dryer could not be approved as an insignificant activity without incorporating limits on annual throughput	- Permit change is a minor modification because PM emissions from the sugar dryer will be less than one ton per year at a maximum production rate of 13,680 tons sugar per year	DOH approved minor modification to PTO 2/7/2000

Summary of Revisions – Covered Source Permit Application No. 0054-01-C
Hawaiian Commercial and Sugar Company Puunene Sugar Mill

Subject	Date	Revision	Reason for Request	Justification or Verification of Compliance with HAR 11-60.1 and NSPS	Remarks
Sulfur dioxide compliance plan	3/10/2000 6/26/2000	- Extend Boiler 3 stack by 20 feet to 140 feet - Limit daily sulfur emissions from all boilers as proposed to show compliance with AAQS until such time as compliance with the 24-hour SO2 standard can be demonstrated without these limits using an EPA-approved model (Note: This demonstration has since been made, so daily sulfur emission limits proposed in the compliance plan should not be included in the CSP)	Air quality modeling indicated that firing fuel oil #6 in Puunene boilers may result in violation of 3-hour and 24-hour SO2 AAQS; DOH requested that these modeled violations be addressed with a compliance plan	- Stack height increase will eliminate modeled violation of 3-hour SO2 AAQS - Proposed limitations on daily sulfur emissions from all boilers will eliminate modeled violation of 24-hour SO2 AAQS using existing approved EPA model - Proposed limitations on daily sulfur emissions will be removed if no AAQS violations are predicted by a future, EPA-approved model	Revised modeling completed in 2005 after increasing the Boiler 3 stack height to 140 feet and ceasing combustion of fuel oil #6 in Boiler 3 showed compliance with all AAQS; limitations on daily sulfur emissions proposed in the compliance plan are therefore no longer required
Boiler 2 oil burners	4/17/2000	Revise Table 1 of the initial CSP application to reflect replacement of two oil burners	Two of four Boiler 2 oil burners were replaced	Periodic replacement of oil burners is routine in oil-fired boilers due to normal wear and tear and is therefore not a modification; rating of new burners is identical to old burners	-

Subject	Date	Revision	Reason for Request	Justification or Verification of Compliance with HAR 11-60.1 and NSPS	Remarks
Biomass boiler requirement	6/26/2000	Specify in the CSP that the existing permit requirement that a minimum of 50% of the annual heat input to each boiler must come from biomass ("biomass boiler designation") is not a federally enforceable permit condition (language proposed)	- Removing the biomass boiler designation at this time would not be considered a modification under the federal definition (potentially triggering PSD/NSR) if (1) the use of more than 50 percent fossil fuels is not prohibited by a federally enforceable permit condition and (2) the boilers were capable of accommodating fossil non-biomass fuels prior to January 6, 1975 - HC&S needs to maintain flexibility to request a permit modification in the future removing the biomass boiler designation	- The existing permit condition was added to Puunene boiler permits in 1989 when the permits were renewed - The requirement was not contained in the state air pollution control rules in effect at the time the permit condition was added, nor in any federal regulations; as such, the permit condition is not currently federally enforceable and can be modified without triggering requirements related to federal permit modifications - The proposed language would not change the current regulatory status of the boilers; any future proposal to remove the biomass boiler designation from the permits would require a permit application and a demonstration of compliance with AAQS	-
Fuel monitoring procedures	6/26/2000 9/5/2000	Describes methods used to monitor daily consumption of fuel oil, specification used oil fuel, and coal in each boiler	Methods requested by DOH as part of SO2 compliance plan	Not applicable	This information was provided in support of SO2 compliance plan, which has since been withdrawn

Summary of Revisions – Covered Source Permit Application No. 0054-01-C
Hawaiian Commercial and Sugar Company Puunene Sugar Mill

Subject	Date	Revision	Reason for Request	Justification or Verification of Compliance with HAR 11-60.1 and NSPS	Remarks
Boiler 3 annual coal consumption limits (memo to EPA Region IX, copy to DOH)	11/1/2000	- Revision of limit on annual coal firing in Boiler 3 - Request concurrence of EPA that existing 35% annual heat input limit can be changed administratively	Provide greater flexibility with respect to coal firing in Boiler 3	- Original ATC/PTO for coal firing in Boiler 3 limited annual coal consumption to 35% of total heat input to the boiler and 45,000 tons per year; these limits were assigned arbitrarily by DOH and have no basis in either state or federal regulations - Because the 45,000 tons per year limit would remain in place, revising the annual heat input limit would have no impact on boiler emissions - EPA letter dated January 19, 1999 regarding correction of erroneous emissions limits or other restrictions should allow administrative revision to address this issue as well	-
Burning confiscated agricultural material	11/15/2000	Incinerate small quantities of agricultural materials confiscated by Hawaii Department of Agriculture (HDOA)	HDOA has a need to periodically dispose of confiscated agricultural materials and requested assistance from HC&S to incinerate these materials	- HC&S boilers are biomass boilers - Quantity of materials incinerated will be no more than 6,000 pounds during any month, and individual lots to be destroyed will consist of one or two boxes weighing 10-20 pounds each	Approved by DOH 11/28/2000
Burning Hawaiian DuraGreen (HDGI) bagasse board off-cuts in Puunene boilers	12/15/2000	Add off-cuts from the bagasse board manufacturing plant as an allowable fuel in the CSP	- Assist in disposing of off-cuts generated by the plant - Provide additional biomass fuel for Puunene boilers	Board off-cuts are 95% dried bagasse; emissions from firing board offsets are not expected to differ significantly from those from firing bagasse	This request has been withdrawn due to closure of the HDGI plant

Subject	Date	Revision	Reason for Request	Justification or Verification of Compliance with HAR 11-60.1 and NSPS	Remarks
Cooking oil fuel	6/22/2001	Request to conduct test burns firing up to 250,000 gallons of cooking oil in Puunene boilers	Fuel is readily available, inexpensive, renewable and environmentally beneficial	- Use of cooking oil fuel is not a modification because boilers are capable of firing cooking oil with no physical changes to the boilers - Estimated emissions of particulate matter, carbon monoxide, nitrogen oxides and sulfur dioxide from cooking oil will be lower than those from an equivalent amount of other permitted fuels (based on Ohio stack test data) - Estimated hydrocarbon emissions from firing 250,000 gallons of cooking oil will be less than one ton higher than those from an equivalent amount of other permitted fuels (based on Ohio stack test data) - Test firing of cooking oil is an insignificant activity under HAR 11-60.1-82(f)(7)	DOH approved test burn as an insignificant activity 7/17/2001

92

Summary of Revisions – Covered Source Permit Application No. 0054-01-C
Hawaiian Commercial and Sugar Company Puunene Sugar Mill

Subject	Date	Revision	Reason for Request	Justification or Verification of Compliance with HAR 11-60.1 and NSPS	Remarks
Boiler 3 NSPS requirements	9/19/2001 10/10/2002 12/9/2002	- Submit NSPS compliance plan for Boiler 3 - Propose new emissions limits during fossil fuel firing in Boiler 3 - Propose monitoring requirements, and other compliance activities to bring Boiler 3 into compliance with 40 CFR Part 60, Subparts A and D - Delete requirement to increase height of Boiler 3 stack proposed as part of SO2 compliance plan - Delete daily sulfur emission limits proposed as part of SO2 compliance plan - Limit sulfur content of fuel oil fired in Boiler 3 to 0.7% by weight	- Boiler 3 is subject to 40 CFR Part 60 Subpart D, NSPS for fossil fuel fired boilers - Referenced requests are submittal of draft and final revised CSP applications to address compliance with the NSPS	- Proposed new emissions limits would comply with Subpart D limits for fossil fuel firing - The SO2 compliance plan previously proposed is no longer necessary, since high sulfur fuel oil #6 can no longer be burned in Boiler 3, thus eliminating modeled violations of AAQS - Firing fuel oil with a sulfur content of no more than 0.7% by weight in Boiler 3 will comply with NSPS limit on SO2 emissions from fuel oil firing - Proposed monitoring of fuel sulfur content in lieu of installing CEMS for SO2 is allowed under 40 CFR Section 60.45(b)(2) - Installation of CEMS for NOx is not required if it can be demonstrated by performance testing that NOx emissions from fossil fuel firing are less than 70% of applicable NSPS limits, per 40 CFR Section 60.45(b)(3) - Proposed alternative to COMS is allowed under 40 CFR Section 60.13(i) if stack moisture or other conditions would preclude operation of a COMS - Proposed alternative opacity monitoring procedure mirrors similar procedure authorized for other facilities equipped with wet scrubbers	- DOH response dated 12/17/2002 stated that CEMS for NOx and SO2 would be required for Boiler 3 stack, and that the request for alternative monitoring of opacity has been forwarded to EPA for a determination (HC&S initiated further discussions with both EPA and DOH and this matter now remains under consideration)

93

Subject	Date	Revision	Reason for Request	Justification or Verification of Compliance with HAR 11-60.1 and NSPS	Remarks
Boiler 3 NSPS requirements (continued)	9/19/2001 10/10/2002 12/9/2002 (continued)	- Add requirement to monitor compliance with NSPS sulfur dioxide emission limit by instituting a fuel sampling and analysis program - Add a requirement to demonstrate by source testing that NOx emissions from fossil fuel firing are less than 70% of applicable NSPS limits - Add a requirement to install CEMS if a demonstration that NOx emissions from fossil fuel firing are less than 70% of applicable NSPS limits cannot be made - Add a requirement to comply with proposed alternative opacity monitoring procedures in lieu of installing COMS - Add a requirement for reporting excess emissions		- Proposed excess emissions reporting complies with 40 CFR Section 60.7(c)	- Proposed CSP revisions relating to continued firing of high sulfur fuel oil #6 (under specified conditions) in Boiler 3 are no longer applicable as HC&S no longer intends to fire this fuel in Boiler 3; these proposed revisions are therefore not included in this summary - Resolution of enforcement action is pending

94

Summary of Revisions – Covered Source Permit Application No. 0054-01-C
Hawaiian Commercial and Sugar Company Puunene Sugar Mill

Subject	Date	Revision	Reason for Request	Justification or Verification of Compliance with HAR 11-60.1 and NSPS	Remarks
Temporary diesel generators	11/30/2001	Request for determination that diesel generators operated during annual facility power outage for maintenance are insignificant activities under HAR 11-60.1-82(f)(7)	HAR 11-60.1 was revised in 2001 to change various provisions relating to insignificant activities, while DOH provided clarification of their interpretation of other provisions; status of off-season diesel generators therefore needed to be clarified	- Diesel generators used during off-season power outages would be operated for no more than 72 hours, and cumulative HP of all equipment subject to the determination would be up to 781 HP; resulting emissions would therefore be less than two tons of any criteria pollutant - Generators qualify as an insignificant activity under HAR 11-60.1-82(f)(7)	DOH approved as insignificant activity 12/20/2001
Portable 40 HP gasoline-fired gunite machine	11/30/2001	Request for determination that a portable 40 HP gasoline-fired gunite machine is an insignificant activity under HAR 11-60.1-82(f)(7)	HAR 11-60.1 was revised in 2001 to change various provisions relating to insignificant activities, while DOH provided clarification of their interpretation of other provisions; exemption formerly applicable to this equipment was changed to apply only to equipment less than 25 HP	- Equipment is used to apply boiler refractory during off-season maintenance period and to mix and apply concrete in construction and maintenance projects; typical annual operating hours for this equipment is less than 100 hours - Based on annual operating hours as high as 569 hours, annual emissions would be less than two tons of NOx, SO2, PM, or VOC and less than five tons of CO - Equipment qualifies as an insignificant activity under HAR 11-60.1-82(g)(9)	DOH revised HAR 11-60.1-82(g)(9) in 2003 to clarify that equipment used to conduct plant maintenance and upkeep activities are insignificant activities

Subject	Date	Revision	Reason for Request	Justification or Verification of Compliance with HAR 11-60.1 and NSPS	Remarks
Insignificant activities	11/30/2001	- Update list of insignificant activities to be included in the CSP (see attachments to November 30, 2001 letter for complete list) - Add appliances containing 50 pounds or more of Class I or Class II ozone depleting substances to the CSP	HAR 11-60.1 was revised in 2001 to change various provisions relating to insignificant activities, while DOH provided clarification of their interpretation of other provisions; the list of insignificant activities intended to be included in the CSP, and the applicable exemptions, therefore needed to be updated	- All insignificant activities listed are covered by provisions of HAR 11-60.1-82(f) and (g); see attachments to letter dated November 30, 2001 for complete list of insignificant activities and corresponding provisions - Appliances containing more than 50 pounds of Class I or Class II ODS are no longer considered insignificant activities under HAR 11-60.1-82(g)(15) and must be included in the CSP	List of equipment was current through November 2001; additional updates have since been provided (as noted below)

Summary of Revisions – Covered Source Permit Application No. 0054-01-C
Hawaiian Commercial and Sugar Company Puunene Sugar Mill

Subject	Date	Revision	Reason for Request	Justification or Verification of Compliance with HAR 11-60.1 and NSPS	Remarks
Alternative monitoring for opacity	3/8/2002	- Request approval for alternative monitoring of opacity in lieu of installation of COMS on Boiler 3 stack - Request included proposed monitoring, recordkeeping, and reporting requirements - Boiler 3 wet scrubber operating parameters (flow and differential pressure) will be monitored, recorded, and maintained within specified limits, and regular visual emissions evaluations per EPA Method 9 will be conducted	- Continuous monitoring of opacity is required under 40 CFR Section 60.45 for the Boiler 3 stack - A continuous opacity monitoring system (COMS) will not function properly on the Boiler 3 stack due to the high moisture content of exhaust gas from the wet scrubber.	- Alternative opacity monitoring is authorized under 40 CFR Section 60.13(i) when a COMS would not provide accurate measurements due to liquid water or other interferences caused by substances in the effluent gas - EPA has previously approved alternative monitoring to COMS identical to that proposed for Boiler 3 for facilities equipped with wet scrubbers	- This request was simultaneously submitted to DOH and to EPA Region IX - DOH response dated 12/17/2002 stated that the proposed alternate opacity monitoring request has been forwarded to EPA for a determination; DOH sent follow-up letter to EPA 2/10/2004

Summary of Revisions – Covered Source Permit Application No. 0054-01-C
Hawaiian Commercial and Sugar Company Puunene Sugar Mill

Subject	Date	Revision	Reason for Request	Justification or Verification of Compliance with HAR 11-60.1 and NSPS	Remarks
Cooking oil fuel	10/10/2002	Add cooking oil as an allowable fuel in the CSP	Fuel is readily available, inexpensive, renewable and environmentally beneficial	Stack testing demonstrates no significant increase in emissions	Combustion of up to 1,000,000 gallons of cooking oil fuel has been approved as an insignificant activity
Wood chips fuel	10/10/2002	- Add a condition limiting annual heat input from wood chips in all three Puunene boilers to no more 3,000,000 MMBTU - Require performance testing demonstrating compliance with NSPS emissions limits as a condition to firing wood chips in Boiler 3	- Limit on combustion of wood chips is self-imposed to avoid potential coverage under the MACT standard for industrial boilers - Performance testing is for compliance with NSPS requirements	- Performance testing demonstrating compliance with NSPS emissions limits applicable during firing of fossil fuels in combination with wood residue will be conducted within 180 days of commencing firing of wood chips in Boiler 3, in compliance with 40 CFR Section 60.8	-

98

Summary of Revisions – Covered Source Permit Application No. 0054-01-C
Hawaiian Commercial and Sugar Company Puunene Sugar Mill

Subject	Date	Revision	Reason for Request	Justification or Verification of Compliance with HAR 11-60.1 and NSPS	Remarks
Food grade sugar dryer	11/11/2002 6/6/2003	Request to modify existing permit to operate to allow an increase in production from the 20,000 lb/hr rotary sugar dryer from 13,680 tons sugar per year to 75,000 tons sugar per year	- Success of the specialty sugar line has prompted HC&S to shift production from raw sugar to specialty sugar, with a commensurate need for increased sugar dryer capacity - Dryer had originally been permitted as a minor modification based on a maximum PM emissions increase of one ton per year; revised HAR 11-60.1 allows a PM emissions increase of up to two tons per year for minor modifications, and stack testing demonstrated that emissions from the sugar dryer are substantially lower than predicted	- Increase in allowable dryer throughput meets the criteria for a "minor modification" under HAR 11-60.1-81, since total particulate matter emissions from the dryer at the new throughput limit will be less than two tons per year - Report of emissions testing on dryer stack submitted in support of new dryer PM emissions estimates	DOH requested additional information 12/30/2002; DOH issued minor modification to PTO 8/11/2003
Cooking oil fuel	11/25/2002	Submit stack test results from combustion of cooking oil in Boiler 3	Results provided in support of request to add cooking oil to CSP as permitted fuel	Not applicable	-

Subject	Date	Revision	Reason for Request	Justification or Verification of Compliance with HAR 11-60.1 and NSPS	Remarks
Cooking oil fuel	11/25/2002	- Allow firing of up to 1,000,000 gallons per year of cooking oil in CSP - Approve firing of up to 1,000,000 gallons per year of cooking oil as an insignificant activity pending issuance of CSP	- Fuel is readily available, inexpensive, renewable and environmentally beneficial - Extension of existing determination that firing cooking oil is an insignificant activity would allow HC&S to continue to fire this fuel pending issuance of the CSP, replacing up to 21,000 barrels of fossil fuel annually	- Use of cooking oil fuel is not a modification because boilers are capable of firing cooking oil with no physical changes to the boilers - Based on stack testing, measured emissions of sulfur dioxide and particulate matter from cooking oil will be lower than those from an equivalent amount of diesel fuel - Based on stack testing, increases in emissions of carbon monoxide, nitrogen oxides, and hydrocarbons from firing 1,180,000 gallons of cooking oil as compared to an equivalent amount of diesel fuel will be insignificant under HAR 11-60.1-82(f)(7) - Test firing of cooking oil is an insignificant activity under HAR 11-60.1-82(f)(7)	DOH requested additional information in support of requests 2/3/2003
Appliances containing more than 50 pounds of ODS	12/5/2002	Update list of appliances containing more than 50 pounds of ozone-depleting substances, to be added to CSP	Appliances containing more than 50 pounds of ODS are no longer considered exempt activities at covered sources under HAR 11-60.1; pursuant to DOH guidance, they must be included in the CSP	- Appliances containing more than 50 pounds of ozone depleting substance must be included in the CSP to comply with HAR 11-60.1-82(d)(6) - Three existing air conditioning units were omitted from a list provided in November 2001 and needed to be added	Updates list submitted November 30, 2001

001

Summary of Revisions – Covered Source Permit Application No. 0054-01-C
Hawaiian Commercial and Sugar Company Puunene Sugar Mill

Subject	Date	Revision	Reason for Request	Justification or Verification of Compliance with HAR 11-60.1 and NSPS	Remarks
Boiler 3 wet scrubber retrofit	12/9/2002	Request concurrence that Phase I of planned improvements to Boiler 3 wet scrubber do not constitute a "modification" requiring permit revision	HC&S plans to convert Boiler 3 wet scrubber from "once-through" to "recirculation" in order to reduce wastewater generated	- Phase I improvements will not result in any increase in boiler emissions - Removal efficiency of wet scrubber will not be adversely impacted	DOH concurred 1/10/2003 that Phase I is not a modification
Alternative monitoring for opacity	4/4/2003	Submit detailed Procedure for Meeting Alternative Opacity Monitoring, Notification, and Recordkeeping Requirements Under 40 CFR Part 60, Puunene Boiler 3 for incorporation into the CSP	Comply with opacity monitoring requirement of 40 CFR Section 60.45 pending DOH approval	- Alternative opacity monitoring is authorized under 40 CFR Section 60.13(i) when a COMS would not provide accurate measurements due to liquid water or other interferences caused by substances in the effluent gas - EPA has previously approved alternative monitoring to COMS identical to that proposed for Boiler 3 for facilities equipped with wet scrubbers	- Submitted as part of the 11th compliance progress report - Implemented 3/1/2003

Subject	Date	Revision	Reason for Request	Justification or Verification of Compliance with HAR 11-60.1 and NSPS	Remarks
Alternatives to CEMS for Boiler 3	4/8/2003	- Request for approval of fuel sampling and analysis (FSA) procedures for coal and fuel oil as an alternative to CEMS for monitoring SO2 from Boiler 3 stack (draft procedures included in submittal) - Request for exemption from requirement to install CEMS for monitoring NOx from Boiler 3 stack	- Compliance with Subpart D emission limits for sulfur dioxide can be readily demonstrated by monitoring the sulfur content of fuels fired in Boiler 3 on a regular basis - Fuel sulfur limits in existing permits to operate provide a substantial margin of compliance with the Subpart D emission limits - A CEMS for monitoring NOx emissions from Boiler 3 is likely to provide data that is not representative of the boiler's actual compliance status with respect to NSPS emissions limits when firing fossil fuels in combination with bagasse - The installation of CEMS for monitoring NOx emissions from Boiler 3 will require a level of control of NOx emissions from bagasse firing that may not be feasible on a continuous basis and is not called for under Subpart D	- Exemption from the CEMS requirements for NOx monitoring is permitted under 40 CFR Section 60.45(b)(3) - Boiler 3 is eligible for exemption from the CEMS requirement for NOx monitoring because stack tests conducted in September 2001, November 2002, October 2003, October 2004, and April 2005 all demonstrated that emissions of NOx from coal firing in Boiler 3 are substantially less than 70% of the Subpart D emission limit (0.7 lb/MMBTU) - Boiler 3 is eligible for exemption from the CEMS requirement for NOx monitoring because stack tests conducted in October 2002, October 2003, October 2004, and April 2005 all demonstrated that emissions of NOx from oil firing in Boiler 3 are substantially less than 70% of the Subpart D emission limit (0.3 lb/MMBTU) - Exemption from the CEMS requirement for SO2 monitoring is permitted under 40 CFR Section 60.45(b)(2) - EPA has previously approved FSA procedures in lieu of CEMS for coal and oil-fired facilities, and the procedures proposed by HC&S are consistent with those previously approved	- This letter was prepared following detailed discussions with both DOH and EPA regarding the CEMS exemptions, and in response to the DOH letter dated 3/11/2003 reiterating the DOH position that CEMS would be required - DOH requested a determination from EPA regarding the requirement to install CEMS on Boiler 3 in letters dated 4/28/2003 and 2/10/2004

Subject	Date	Revision	Reason for Request	Justification or Verification of Compliance with HAR 11-60.1 and NSPS	Remarks
Alternatives to CEMS for Boiler 3 (continued)	4/8/2003 (continued)			- The proposed exemptions are consistent with the Compliance Assurance Monitoring (CAM) Rule, which specifically allows for existing alternatives to CEMS and COMS	
Boiler 3 wet scrubber conversion to recirculation	8/15/2003 11/21/2003	Application for minor modification to Boiler 3 PTO allowing Phase II conversion of wet scrubber to recirculation	Convert Boiler 3 wet scrubber from "once-through" to "recirculation" in order to reduce wastewater generated	- Per scrubber manufacturer's guarantee, particulate matter emissions will remain unchanged following scrubber conversion, provided that the scrubber is operated in accordance with its original design parameters and scrubber blowdown is adequate to maintain less than 3% solids - HC&S will install a caustic soda injection system to maintain neutral scrubber water pH, thereby ensuring there will be no increase in SO2 emissions as a result of the conversion to recirculation	- DOH approved Phase II improvements 12/18/2003 and determined that a permit amendment was not required, but added a requirement to monitor and record scrubber bleed rate - Phase II improvements, including caustic injection, have been installed

Summary of Revisions – Covered Source Permit Application No. 0054-01-C
Hawaiian Commercial and Sugar Company Puunene Sugar Mill

Subject	Date	Revision	Reason for Request	Justification or Verification of Compliance with HAR 11-60.1 and NSPS	Remarks
107 HP emergency diesel generator at Kaheka hydroelectric plant	8/19/2004	Add new 107 HP emergency diesel generator to list of insignificant activities	New diesel generator installed at Kaheka hydroelectric plant	Generator is an exempt source under HAR 11-60.1-62(d)(7) and would also be considered an insignificant activity under HAR 11-60.1-82(f)(5)	Equipment is not part of the Puunene covered source and should not be added to the CSP
505,000 BTU/hr RECO water heater at HARC Experiment Station	4/20/2004	Add new LPG-fired RECO water heater to the CSP; delete existing Bock water heater at the HARC Experiment Station from the CSP	Replacement of old water heater with new water heater	New water heater is an insignificant activity under HAR 11-60.1-82(f)(3)	-
Cooking oil fuel	5/31/2004	Minor modification to Boiler 3 Permits to Operate to allow combustion of up to 1,000,000 gallons per year of cooking oil fuel (pending issuance of CSP)	- Fuel is readily available, inexpensive, renewable and environmentally beneficial - Permit modification would allow HC&S to continue to fire this fuel pending issuance of the CSP	Emissions increases from firing cooking oil as compared to other permitted fuels will be less than five tons per year of carbon monoxide and less than two tons per year of any other pollutant	DOH approved combustion of cooking oil in Boiler 3 as insignificant activity under HAR 11-60.1-82(f)(7) on July 6, 2004; long-term use of cooking oil will be subject to CSP requirements

Summary of Revisions – Covered Source Permit Application No. 0054-01-C
Hawaiian Commercial and Sugar Company Puunene Sugar Mill

Subject	Date	Revision	Reason for Request	Justification or Verification of Compliance with HAR 11-60.1 and NSPS	Remarks
Boiler 3 stack height increase	8/30/2004	Increase Boiler 3 stack height from 120 to 140 feet in conjunction with repairs to the top of the stack	Top of Boiler 3 stack is in deteriorated condition and needs to be repaired	- Repairs to the Boiler 3 stack are necessary due to deterioration of the upper section of the stack - Addition of the new 20-foot stack extension can be readily accomplished at the same time as the repairs - Extension of the Boiler 3 stack was previously proposed to address modeled violations of the short-term SO2 AAQS; stack height increase will help to reduce downwash that results in ground-level emissions during certain weather conditions - A previous stack height extension at Paia Mill was deemed by DOH not to require a permit - HC&S will prepare a revised ambient air quality analysis showing that the stack height increase will nor cause or contribute to violations of AAQS	- Approved by DOH 10/26/2004 - Repairs and stack height increase completed January 2005
Fuel sampling and analysis for coal	10/25/2004	Approve fuel sampling and analysis as an alternative to CEMS for monitoring SO2 emissions from Boiler 3	DOH requested additional information regarding FSA procedures for coal	- Variability in coal sulfur content is not expected to be an issue with respect to compliance with the NSPS emissions limits due to the large compliance margin afforded by the current limit on coal sulfur content (0.5% by weight) - The proposed FSA procedure provides the most reliable and least complex means of monitoring sulfur dioxide emissions from Boiler 3	-

Summary of Revisions – Covered Source Permit Application No. 0054-01-C
Hawaiian Commercial and Sugar Company Puunene Sugar Mill

Subject	Date	Revision	Reason for Request	Justification or Verification of Compliance with HAR 11-60.1 and NSPS	Remarks
Revised ambient air quality analysis	12/16/2004	Revised ambient air quality analysis to reflect (1) increase in Boiler 3 stack height; (2) new Boiler 3 emission limits under the NSPS; and (3) new meteorological data collected at Puunene	Submitted at request of DOH	Revised analysis demonstrates that the Puunene Mill boilers will not cause or contribute to violations of AAQS	-
Specification used oil fuel	5/24/2005	Request to burn up to 1,000,000 gallons per year of specification used oil fuel in place of fuel oil #6 in Boilers 1 and 2	- Replacing fuel oil #6 combusted in Boilers 1 and 2 with specification used oil fuel would reduce criteria pollutant emissions and reduce annual fuel costs - Request was limited to Boilers 1 and 2 in order to expedite approval in the face of rising fossil fuel costs; request to add specification used oil fuel from outside sources to the CSP as an allowable fuel for all three boilers remains pending	- Regardless of the quantity of specification used oil fuel fired, used oil combustion would comply with state requirements - Specification used oil fuel is regulated as virgin fuel oil at the federal level - Boilers were capable of firing used oil fuel when constructed, so fuel switch is not a modification - Emissions of all criteria pollutants except hydrocarbons would be lower from firing specification used oil than from firing an equivalent amount of fuel oil #6; increase in hydrocarbon emissions would be negligible	Approved by DOH 6/2/2005
Specification used oil fuel	6/7/2005	Request to allow up to 0.75% sulfur by weight in specification used oil fuel fired in Boilers 1 and 2	Primary used oil supplier is not able to guarantee a sulfur content less than 0.5% in all deliveries of specification used oil fuel	Proposed 0.75% sulfur limit in specification used oil fuel remains well below the 2.0% sulfur limit in fuel oil #6 currently combusted in Boilers 1 and 2	Approved by DOH 6/8/2005

Summary of Revisions – Covered Source Permit Application No. 0054-01-C
Hawaiian Commercial and Sugar Company Puunene Sugar Mill

Subject	Date	Revision	Reason for Request	Justification or Verification of Compliance with HAR 11-60.1 and NSPS	Remarks
Alternative opacity monitoring	5/11/2005	Revise allowable wet scrubber operating limits under the proposed Boiler 3 alternative opacity monitoring procedure	Boiler 3 wet scrubber is now capable of operating in either once-through or recirculation mode; the range of acceptable scrubber operating parameters in the two modes differ	Compliance with particulate matter emissions limits and opacity limits has been demonstrated at the minimum wet scrubber flows and differential pressures proposed for each fuel	Submitted as part of the 19th compliance progress report
Alternative opacity monitoring	7/1/2005	Submit revised alternative opacity monitoring procedure reflecting wet scrubber operating parameters for recirculation mode	Boiler 3 wet scrubber is now capable of operating in either once-through or recirculation mode; the range of acceptable scrubber operating parameters in the two modes differ	Compliance with particulate matter emissions limits and opacity limits has been demonstrated at the minimum wet scrubber flows and differential pressures proposed for each fuel	Submitted as part of the 20th compliance progress report
Coal fuel sampling and analysis procedures	7/1/2005	Submit additional detail regarding Boiler 3 coal FSA procedure	Requested by DOH	- Use of coal FSA in lieu of CEMS for SO2 monitoring is permitted under 40 CFR Section 60.45(b)(2) - EPA has previously approved FSA procedures in lieu of CEMS for coal and oil-fired facilities, and the procedures proposed by HC&S are consistent with those previously approved	Submitted as part of the 20th compliance progress report

Summary of Revisions – Covered Source Permit Application No. 0054-01-C
Hawaiian Commercial and Sugar Company Puunene Sugar Mill

Subject	Date	Revision	Reason for Request	Justification or Verification of Compliance with HAR 11-60.1 and NSPS	Remarks
Note: All of the following revisions were added to the table after it was submitted to the Department of Health in July 2005.					
Coal fuel sampling and analysis procedures	9/14/2005	Clarify manual sample preparation as an option for coal FSA procedure	May be more cost effective, based on proposals received for automatic sample preparation equipment	- Manual sample preparation would still comply with ASTM standards for preparing coal samples for analysis	Submitted as part of the 21st compliance progress report
Change in responsible official	3/30/2006	Frank Kiger is responsible official for matters pertaining to the permit	Retirement of Felix Hubinger	N/A	Submitted as part of the 23rd compliance progress report
Sugar dryer	6/9/2006	Restore operation of the sugar dryer heater and fan	Improve sugar drying	- Stack testing demonstrates that particulate matter emissions will not increase when dryer and fan are operated	Earlier stack testing in support of current throughput limit was conducted with the dryer and heater disconnected
Clean Air Mercury Rule (CAMR)	8/20/2006	Clarification that CAMR is not an applicable requirement	Requested by DOH	- Boilers do not meet the applicability requirements under 40 CFR Part 60, Subpart Da or Subpart HHHH	-
Initial notification under 40 CFR Part 63, Subpart DDDDD	10/13/2006	Addition of new applicable requirement	Notification required by 40 CFR Part 63, Subpart A	N/A	Also added to compliance plan submitted with 26th compliance progress report

Attachment 8

Procedure for Meeting Alternative Opacity Monitoring, Notification and Recordkeeping Requirements—Puunene Boilers 1, 2 and 3

Procedure for Meeting Alternative Opacity Monitoring, Notification, and Recordkeeping Requirements – Puunene Mill Boilers 1, 2, and 3
(Rev. December 19, 2006)

I. Purpose

The purpose of this procedure is to ensure that HC&S complies with the provisions of its Alternative Monitoring for Opacity of all three Puunene boilers. The specific requirements of this procedure apply to alternative monitoring of opacity for the Puunene boilers and appurtenant equipment only; in the event of future installation of a Continuous Emissions Monitoring System (CEMS) for monitoring of gaseous pollutants, a revised procedure will be developed. HC&S must also at all times comply with any additional monitoring, recordkeeping, and reporting requirements under the facility's covered source air permit.

II. Responsibility

The Power Plant Manager is responsible for ensuring compliance with the requirements of this procedure, including providing required data to environmental staff for preparation of required reports.

The HC&S Environmental Affairs Specialist is responsible for providing appropriate training to power plant personnel regarding the requirements of this procedure, regular monitoring of compliance (including advising power plant staff of monitoring, recordkeeping, and reporting discrepancies and recommended corrective actions), and submitting required reports to regulatory agencies.

The Vice-President, Production and Maintenance is responsible for oversight of the power plant and for certifying the completeness and accuracy of all required reports.

III. Opacity Monitoring Requirements

1. The following monitoring must be conducted on the Boiler 1 and 2 stack, and on the Boiler 3 stack in lieu of installing a continuous opacity monitoring system (COMS).
   a. Continuously monitor and record the scrubber liquid flow rate to each wet scrubber and the one-hour average scrubbing liquid flow rate.
   b. Continuously monitor and record the pressure drop of the gas stream across each wet scrubber venturi and the one-hour average pressure drop.
   c. Conduct at least two consecutive six-minute visual emissions evaluations (VEE) of each stack in accordance with Method 9 of 40 CFR Part 60, Appendix A each month.

2. Monitoring devices shall be installed, operated, maintained and calibrated such that representative measurements of scrubber operating parameters are obtained. The range of the monitoring devices shall be sufficient to measure the minimum and maximum operating values of the scrubber parameters, and sensors shall be easily accessible in order to perform repairs and routine maintenance.

3. Except for system breakdowns, repairs, calibration checks, and zero span adjustments, equipment for monitoring and recording scrubber liquid flow rate and venturi pressure drop shall be in continuous operation. Requirements for recording and reporting of periods when monitoring equipment is not in operation are provided in Sections VI and VII below.

4. The one-hour average of scrubber operating parameters shall be a running 60-minute average and shall be determined from a minimum of ten or more data points equally spaced over each 60 minute period; an arithmetic or integrated average of all data may be used. Data collected during periods of continuous equipment breakdown, repair, calibration checks, and zero and span adjustments shall not be included in the data averages computed under this section.

5. A quality assurance and control plan shall be developed and implemented to verify that the monitoring devices are generating quality-assured data. The monitoring devices shall meet appropriate ASME (American Society of Mechanical Engineers) or other applicable specifications.

6. Monthly visible emissions evaluations (VEE) shall be conducted, recorded, and reported to the Department of Health using the forms attached to this procedure. Each VEE shall be conducted by a certified observer in accordance with Method 9.

IV. Minimum Scrubber Operating Parameters

Failure to maintain the minimum specified operating parameters for either wet scrubber at any time shall constitute a violation and be defined as excess emissions. The minimum scrubber operating parameters have been developed from the wet scrubber design specifications and past stack testing demonstrating compliance with particulate matter emissions limits.

The Boilers 1 and 2 wet scrubber operates only in recirculation mode. For Boilers 1 and 2, the minimum wet scrubber operating parameters (based on a 60-minute rolling average) are as provided in Table 1 below.

Table 1
Puunene Boilers 1 and 2 Alternative Opacity Monitoring
Minimum Scrubber Operating Parameters for Various Operating Scenarios

Operating Scenario	Minimum Scrubbing Liquid Flow Rate	Minimum Venturi Differential Pressure
One or both boilers firing bagasse alone or bagasse in combination with fuel oil	2,800 gallons per minute	4.3 inches water column
One or both boilers firing coal alone or coal in combination with bagasse and/or fuel oil	2,800 gallons per minute	5.0 inches water column
One or both boilers firing fuel oil alone (Note 1)	2,800 gallons per minute	4.3 inches water column

Note 1: With the exception of annual stack testing, the boilers are not normally operated on 100% fuel oil.

The Boiler 3 wet scrubber is capable of operating in either of two modes:

(1) Recirculation Mode – In this mode, water passing through the wet scrubber is constantly recirculated and reused except for a small percentage of blowdown that is discharged to the millwater system to prevent accumulation of excessive solids in the scrubber water. Clean makeup water is added as necessary to replace water lost through blowdown or evaporation. This mode is intended to minimize the amount of wastewater generated by the wet scrubber and is the normal operating mode.

(2) "Once-Through" Mode – In this mode, water passing through the wet scrubber is used only once and is then discharged to the millwater system for disposal. This mode will normally be used only during malfunction or maintenance of the recirculation system, or during off-season when wastewater minimization is less of an issue.

For Boiler 3, minimum wet scrubber operating parameters (based on a 60-minute rolling average) have been developed for each mode and are provided in the Tables 2 and 3 below.

Table 2
Puunene Boiler 3 Alternative Opacity Monitoring
Minimum Scrubber Operating Parameters for Various Operating Scenarios
Wet Scrubber in Recirculation Mode

Operating Scenario	Minimum Scrubbing Liquid Flow Rate	Minimum Venturi Differential Pressure
Boiler 3 firing bagasse alone or bagasse in combination with diesel fuel	2,000 gallons per minute	4.0 inches water column
Boiler 3 firing coal alone or coal in combination with bagasse and/or diesel fuel	2,200 gallons per minute	5.0 inches water column
Boiler 3 firing diesel fuel alone (Note 1)	2,050 gallons per minute	4.2 inches water column

Note 1: With the exception of annual stack testing, Boiler 3 is not normally operated on 100% diesel fuel.

Table 3 Puunene Boiler 3 Alternative Opacity Monitoring Minimum Scrubber Operating Parameters for Various Operating Scenarios Wet Scrubber in "Once-Through" Mode		
Operating Scenario	**Minimum Scrubbing Liquid Flow Rate**	**Minimum Venturi Differential Pressure**
Boiler 3 firing bagasse alone or bagasse in combination with diesel fuel	1,400 gallons per minute	4.0 inches water column
Boiler 3 firing coal alone or coal in combination with bagasse and/or diesel fuel	1,400 gallons per minute	5.5 inches water column
Boiler 3 firing diesel fuel alone (Note 1)	1,600 gallons per minute	4.5 inches water column

Note 1: With the exception of annual stack testing, Boiler 3 is not normally operated on 100% diesel fuel.

In order to simplify monitoring and reporting requirements, HC&S will normally maintain wet scrubber operating parameters above the levels specified for the most limiting operating scenario above.

V. Excess Emissions

For the purposes of this procedure, excess emissions are defined as:

1. Any period when the one-hour average scrubbing liquid flow rate to the Boilers 1 and 2 wet scrubber is less than the value specified in Table 1 for the fuel being fired, or any period when the one-hour average scrubbing liquid flow rate to the Boiler 3 wet scrubber is less than the value specified in Table 2 or Table 3 for the fuel being fired and the mode of scrubber operation.
2. Any period when the one-hour average pressure drop of the gas stream across the Boilers 1 and 2 wet scrubber venturi is less than the value specified in Table 1 for the fuel being fired, or any period when the one-hour average pressure drop of the gas stream across the Boiler 3 wet scrubber venturi is less than the value specified in Table 2 or Table 3 for the fuel being fired and the mode of scrubber operation.
3. Any six-minute period when emissions from either stack exhibit opacity of 20 percent or greater (opacity of up to 60 percent shall be permitted for any period or periods aggregating no more than six minutes in any one hour during startup, shutdown, or equipment breakdown; however, these occurrences must still be recorded).

VI. Recordkeeping Requirements

All records, including support information, required under this section shall be maintained for a period of at least five (5) years from the date of such records. Support information includes all calibration and maintenance records and all original electronic records and/or strip chart recordings of the monitoring devices, and copies of all reports required under this section. HC&S shall establish suitable logs to ensure that all required information is properly recorded. The following records must be maintained in a permanent form suitable for inspection and shall be made available to the Department of Health upon request.

1. For each boiler, records of the total operating time (in minutes) during each six-month reporting period. For the purposes of this requirement, the boiler is considered to be operating when any fuel is being fired in the boiler such that emissions are produced.

2. For each boiler, records of the date, time, duration, and description of any startup, shutdown, equipment breakdown or malfunction in the operation of the boilers, wet scrubbers, and appurtenant equipment. Records shall include a description of all repairs and adjustments.

3. For each wet scrubber, records of the date, time, duration, and description of any malfunction or breakdown periods of a continuous monitoring system or monitoring device (e.g., wet scrubber flow, venturi differential pressure monitoring/recording equipment). Records shall include a description of all repairs and adjustments. Records of monitoring device downtime (periods when a monitor is inoperative while boiler remains in operation) shall be maintained and categorized as follows:

   a. Monitor equipment malfunctions (e.g., pressure or differential pressure instruments);
   b. Non-monitor equipment malfunctions (e.g., recording devices);
   c. Quality assurance (e.g., calibration);
   d. Other known causes (specify); and
   e. Unknown causes.

   Records shall also be maintained of the number of incidents and total monitoring system downtime for each six-month reporting period.

4. Records of the date and start/end time of each period of excess emissions (as defined in Section V above), the magnitude of excess emissions (i.e., the observed opacity and/or the amount by which scrubber operating parameters were below required limits), the cause of the excess emissions, and the corrective action taken or preventative measures adopted. Records of excess emissions shall be maintained and categorized as follows:

   a. Startup/shutdown;
   b. Control equipment problems;
   c. Process problems;
   d. Other known causes (specify); and
   e. Unknown causes.

   Records shall also be maintained of the number of incidents and total duration of excess emissions for each six-month monitoring period.

5. For each wet scrubber, the following documentation of the monitoring devices for scrubber liquid flow rate and venturi differential pressure:

   a. All monitoring device measurements recorded by the continuous monitoring system, including all 60-minute rolling average values of the scrubber operating parameters.
   b. All monitoring system performance evaluations, device calibration checks, and any adjustments, maintenance, and repairs performed on these systems.

6. Records of all VEE observations conducted on each stack (as recorded on the Monthly Visible Emission Evaluation Form). For any month during which neither Boiler 1 nor Boiler 2 operated, or during which Boiler 3 did not operate, a Monthly Visible Emission Evaluation Form shall be completed and filed documenting that the boiler(s) did not operate during the month.

7. Copies of all reports required to be submitted under this procedure.

The Puunene Power Production Department shall maintain suitable logs to ensure that all required information is recorded.

VII. Reporting Requirements and Compliance Assurance

This section outlines requirements for monthly compliance assurance reporting to the Environmental Affairs Specialist by the Puunene Power Production Department, and semi-annual reporting to the Department of Health Clean Air Branch. The Environmental Affairs Specialist shall prepare the required

semi-annual reports based on information provided in the monthly compliance assurance reports; therefore, it is essential that these monthly reports be completed in a timely and accurate manner.

Reporting requirements outlined in this section are in addition to any other reporting requirements applicable to the facility. Power Plant personnel must continue to make verbal and written reports of violations of emissions limitations (including visual emissions) and/or shutdown of air pollution control equipment for scheduled maintenance as required by State air pollution control rules (HAR Sections 11-60.1-15 and 16). For the purposes of meeting requirements for prompt reporting of deviations, any period of excess emissions as defined under Section V above should be considered reportable under HAR Section 11-60.1-16 (i.e., requiring immediate reporting to the Department of Health Clean Air Branch with a follow-up written report within five days).

1. **Monthly Summary Reports**: For compliance assurance purposes, and to assist in the preparation of the required semiannual reports to the Department of Health, the Puunene Power Production Department shall provide monthly summary reports to the Environmental Affairs Specialist using the attached form entitled "Monthly Summary Report – Alternative Opacity Monitoring". One report shall be prepared for Boilers 1 and 2 and a second report shall be prepared for Boiler 3. The reports should be completed within 15 days after the end of each month, and shall include:
   a. The reporting period dates.
   b. The total source operating time during the reporting period (in minutes). For Boilers 1 and 2, the time reported shall be the total time during which one or both boilers was operating during the reporting period.
   c. The duration of excess emissions during the reporting period due to various causes (in minutes).
   d. The total duration of excess emissions (in minutes).
   e. The total duration of excess emissions as a percentage of total source operating time.
   f. The number of incidents of excess emissions.
   g. The duration of continuous monitoring system (i.e., scrubber liquid flow rate and venturi differential pressure monitoring systems) downtime due to various causes (in minutes).
   h. The total duration of monitoring system downtime (in minutes).
   i. The total duration of monitoring system downtime as a percentage of total source operating time.
   j. The number of incidents of monitor downtime.

2. **Compliance Assurance**: Upon receipt of the Monthly Summary Reports, the Environmental Affairs Specialist shall review the report for completeness and review any discrepancies and required corrective actions with the Power Plant Manager. In addition, the Environmental Affairs Specialist shall periodically review the records required under Section VI to ensure that they are complete, accurate, and up-to-date, and shall review any discrepancies and required corrective actions with the Power Plant Manager.

   Records reviews shall be conducted at least annually and any time when the monthly duration of excess emissions is one percent or more of the total source operating time or the monthly duration of monitoring system downtime is five percent or more of the total source operating time.

3. **Semi-Annual Reporting – Summary Reports**: For each semi-annual period (January 1 to June 30 and July 1 to December 31), the Environmental Affairs Specialist shall prepare "Excess Emissions and Monitoring Device Performance Summary Reports" on the attached forms. One report shall be prepared for Boilers 1 and 2 and a second report shall be prepared for Boiler 3. The reports must be submitted to the Department of Health Clean Air Branch and to the Regional Administrator, EPA Region IX (attention: Director, Air Division) and must be postmarked by the 30th day following the end of each six-month reporting period.

   The summary report shall contain all of the information shown on the attached forms entitled "Excess Emissions and Monitoring Device Performance Summary Report", including:

a. The reporting period dates.
b. The total source operating time during the reporting period (in minutes). For Boilers 1 and 2, the time reported shall be the total time during which one or both boilers was operating during the reporting period.
c. The duration of excess emissions during the reporting period due to various causes (in minutes).
d. The total duration of excess emissions (in minutes).
e. The total duration of excess emissions as a percentage of total source operating time.
f. The number of incidents of excess emissions.
g. The duration of continuous monitoring system (i.e., scrubber liquid flow rate and venturi differential pressure monitoring systems) downtime due to various causes (in minutes).
h. The total duration of monitoring system downtime (in minutes).
i. The total duration of monitoring system downtime as a percentage of total source operating time.
j. The number of incidents of monitor downtime.
k. On a separate page, a description of any changes since the previous report in the continuous monitoring systems, process, or controls.
l. A certification signed by a responsible official that the information contained in the report is true, accurate, and complete. Mandatory certification language is provided in Section VII.6 below.

If the total duration of excess emissions for the reporting period is less than one percent of the total operating time for the reporting period and the continuous monitoring system downtime for the reporting period is less than five percent of the total operating time for the period, then only the summary report needs to be submitted and the excess emission report described in Section VII.4 below need not be submitted unless requested by the Department of Health or EPA Regional Administrator.

4. **Semi-Annual Reporting – Excess Emissions Report**: For each semi-annual period (January 1 to June 30 and July 1 to December 31) when the total duration of excess emissions for the reporting period is one percent or greater of the total operating time for the reporting period or the continuous monitoring system downtime for the reporting period is five percent or greater of the total operating time for the period, or if requested by the Department of Health or EPA Regional Administrator, the Environmental Affairs Specialist shall prepare an Excess Emissions Report in addition to the summary report described in Section VII.3 above. The report must be submitted to the Department of Health Clean Air Branch and the Regional Administrator, U.S. EPA Region IX (attention: Director, Air Division), and must be postmarked by the 30th day following the end of each six-month reporting period.

No format is specified for the Excess Emissions Report. However, the report must include the following information:
a. The reporting period dates.
b. The total source operating time during the reporting period (in minutes).
c. The magnitude of any excess emissions, and the date and time of commencement and completion of each period of excess emissions.
d. Specific identification of each period of excess emissions that occurs during startups, shutdowns, and malfunctions of the affected source (Boilers 1 and 2 and/or Boiler 3), the nature and cause of any malfunction (if known), and the corrective action or preventative measures adopted.
e. The date and time identifying each period during which the continuous monitoring system (for scrubber liquid flow rate and venturi differential pressure) was inoperative (except for zero and span checks, if applicable) and the nature of any system repairs or adjustments.
f. In the event that excess emissions reporting is pursuant to a request form the Department of Health or Regional Administrator and no excess emissions have occurred or the continuous monitoring systems have not been inoperative, repaired, or adjusted, such information shall be stated in the report.

m. A certification signed by a responsible official that the information contained in the report is true, accurate, and complete. Mandatory certification language is provided in Section VI.6 below.

5. **Semi-Annual Reporting – Visible Emissions Evaluation Report:** For each semi-annual period (January 1 to June 30 and July 1 to December 31), the Environmental Affairs Specialist shall prepare a "Visible Emissions Evaluation Report" on the attached form. The report shall provide the date and the six minute average opacity reading for each monthly visual emissions evaluation during which the opacity limit was exceeded. If there were no exceedances during the monthly observations, then the report shall so indicate.

6. **Certification of Reports**: All certifications of reports required by this procedure must include the following mandatory statement, signed by a Responsible Official:

I certify that I have knowledge of the facts herein set forth, that the same are true, accurate, and complete to the best of my knowledge and belief, and that all information not identified by me as confidential in nature shall be treated by the Department of Health as public record.

VIII. Attachments

Monthly Summary Report – Alternative Opacity Monitoring
Excess Emissions and Monitoring Device Performance Summary Report (Boilers 1 and 2)
Excess Emissions and Monitoring Device Performance Summary Report (Boiler 3)
Monthly Visible Emission Evaluation Form (with instructions)
Visible Emissions Evaluation Report

Monthly Summary Report – Alternative Opacity Monitoring

Source (check one): ☐ Boilers 1 and 2 ☐ Boiler 3

Reporting period dates: From _____ to _____

Company: Hawaiian Commercial and Sugar Company

Date of Latest CMS Certification or Audit: _____
(Enter date that differential pressure and flow instruments were last calibrated.)

Total source operating time in reporting period: _____ minutes

Emission Data Summary		CMS Performance Summary	
1. Duration of excess emissions in reporting period due to:		1. CMS downtime in reporting period due to:	
a. Startup/shutdown.....		a. Monitor equipment malfunctions.....	
b. Control equipment problems.....		b. Non-Monitor equipment malfunctions...	
c. Process problems.....		c. Quality assurance calibration.....	
d. Other known causes.....		d. Other known causes.....	
e. Other unknown causes.....		e. Unknown causes.....	
2. Total duration of excess emissions..... ..		2. Total CMS downtime.....	
3. [Total duration of excess emissions] x (100) ÷ [Total source operating time].....	%	3. [Total CMS downtime] x (100) ÷ [Total source operating time].....	%
4. Number of incidents of excess emissions.....		4. Number of incidents of monitor downtime...	

On a separate page, describe any changes since the last report in continuous monitoring systems (CMS), process, or controls. A separate page is: ☐ ATTACHED ☐ NOT APPLICABLE (NO CHANGES) (check one)

Completed by:

Name: _____ Signature: _____

Title: _____ Date: _____

Summary Report: Excess Emissions and Monitoring Device Performance Summary Report

Scrubber Operating Parameter Limits:

1. 2,800 gpm on a sixty minute rolling average (all fuels)
2. 4.3 inches water column (bagasse/fuel oil)/5.0 inches water column (coal) on a sixty minute rolling average
3. Opacity less than 20 percent

Reporting period dates: From _____ to _____

Company/Location: Hawaiian Commercial and Sugar Company/ P.O. Box 266 Puunene, Maui, Hawaii 96784

Monitor Manufacturer and Model Number:

Scrubber liquid flow rate _____

Venturi differential pressure _____

Date of Latest CMS Certification or Audit: _____

Process Unit Description: Two 125,000 lb/hr multi-fuel Riley Stoker boilers (Puunene Boilers 1 and 2) with multiclones and venturi wet scrubber serving a common stack

Total source operating time in reporting period: _____ minutes

Emission Data Summary		CMS Performance Summary	
1. Duration of excess emissions (minutes) in reporting period due to:		1. CMS downtime (minutes) in reporting period due to:	
a. Startup/shutdown.....		a. Monitor equipment malfunctions.....	
b. Control equipment problems.....		b. Non-Monitor equipment malfunctions...	
c. Process problems.....		c. Quality assurance calibration.....	
d. Other known causes.....		d. Other known causes.....	
e. Other unknown causes.....		e. Unknown causes.....	
2. Total duration of excess emissions..... ..		2. Total CMS downtime.....	
3. [Total duration of excess emissions] x (100) ÷ [Total source operating time].....	[1] %	3. [Total CMS downtime] x (100) ÷ [Total source operating time].....	[1] %
4. Number of incidents of excess emissions...		4. Number of incidents of monitor downtime..	

[1] For the reporting period: If the total duration of excess emissions is one percent or greater of the total operating time or the total CMS downtime is 5 percent or greater of the total operating time, both the summary report and the excess emission report shall be submitted.

On a separate page, describe any changes since the last report in continuous monitoring systems (CMS), process, or controls. A separate page is: ☐ ATTACHED ☐ NOT APPLICABLE (NO CHANGES) (check one)

I certify that I have knowledge of the facts herein set forth, that the same are true, accurate, and complete to the best of my knowledge and belief, and that all information not identified by me as confidential in nature shall be treated by the Department of Health as public record.

Name: _____ Signature: _____

Title: _____ Date: _____

Summary Report: Excess Emissions and Monitoring Device Performance Summary Report

Scrubber Operating Parameter Limits:

1. Recirculation Mode: 2,000 gpm (bagasse)/2,200 gpm (coal)/2,050 gpm (diesel fuel) on a sixty minute rolling average
   Once-Through Mode: 1,400 gpm (bagasse or coal)/1,600 gpm (diesel fuel) on a sixty minute rolling average
2. Recirculation Mode: 4.0 inches water column (bagasse)/5.0 inches water column (coal)/4.2 inches water column (diesel fuel) on a sixty minute rolling average
   Once-Through Mode: 4.0 inches water column (bagasse)/5.5 inches water column (coal)/4.5 inches water column (diesel fuel) on a sixty minute rolling average
3. Opacity less than 20 percent

Reporting period dates: From _____ to _____

Company/Location: Hawaiian Commercial and Sugar Company/ P.O. Box 266 Puunene, Maui, Hawaii 96784

Monitor Manufacturer and Model Number:

Scrubber liquid flow rate _____

Venturi differential pressure _____

Date of Latest CMS Certification or Audit: _____

Process Unit Description: 290,000 lb/hr multi-fuel Foster Wheeler boiler (Puunene Boiler 3) with multiclones and venturi wet scrubber serving a common stack

Total source operating time in reporting period: _____ minutes

Emission Data Summary		CMS Performance Summary	
1. Duration of excess emissions (minutes) in reporting period due to:		1. CMS downtime (minutes) in reporting period due to:	
a. Startup/shutdown.....		a. Monitor equipment malfunctions.....	
b. Control equipment problems.....		b. Non-Monitor equipment malfunctions...	
c. Process problems.....		c. Quality assurance calibration.....	
d. Other known causes.....		d. Other known causes.....	
e. Other unknown causes.....		e. Unknown causes.....	
2. Total duration of excess emissions..... ..		2. Total CMS downtime.....	
3. [Total duration of excess emissions] x (100) ÷ [Total source operating time].....	[1] %	3. [Total CMS downtime] x (100) ÷ [Total source operating time].....	[1] %
4. Number of incidents of excess emissions...		4. Number of incidents of monitor downtime..	

[1] For the reporting period: If the total duration of excess emissions is one percent or greater of the total operating time or the total CMS downtime is 5 percent or greater of the total operating time, both the summary report and the excess emission report shall be submitted.

On a separate page, describe any changes since the last report in continuous monitoring systems (CMS), process, or controls. A separate page is: ☐ ATTACHED ☐ NOT APPLICABLE (NO CHANGES) (check one)

I certify that I have knowledge of the facts herein set forth, that the same are true, accurate, and complete to the best of my knowledge and belief, and that all information not identified by me as confidential in nature shall be treated by the Department of Health as public record.

Name: _____ Signature: _____

Title: _____ Date: _____

Monthly Visible Emission Evaluation Form

The following Visible Emissions Evaluation (VEE) Form shall be completed **monthly** (*each calendar month*) for each equipment subject to opacity limits in accordance with Method 9 of 40 CFR Part 60, Appendix A. The VEE Form shall be completed as follows:

1. Visible emissions observations shall take place during the day only. The opacity shall be noted in 5 percent increments (i.e., 25%).

2. Orient the sun within a 140 degree sector to your back. Provide a source layout sketch on the VEE Form using the symbols as shown.

3. Stand at least three (3) stack heights, but not more than a quarter mile from the stack.

4. Two (2) observations shall be taken at fifteen (15) second intervals for six (6) consecutive minutes for each equipment.

5. The six (6) minute average opacity reading shall be calculated for each observation.

6. If possible, the observations shall be performed as follows:

    a. Read from where the line of sight is at right angles to the wind direction.
    b. The line of sight shall not include more than one (1) plume at a time.
    c. Read at the point in the plume with the greatest opacity (without condensed water vapor), ideally while the plume is no wider than the stack diameter.
    d. Read the plume at fifteen (15) second intervals only. Do not read continuously.
    e. The equipment shall be operating at maximum permitted capacity.

7. If the equipment was shutdown for that period, briefly explain the reason for shutdown in the comment column.

HC&S shall retain the completed VEE Forms for recordkeeping. These records shall be in a permanent form suitable for inspection, retained for a minimum of five (5) years, and made available to the Department of Health, or their representative upon request.

Monthly Visible Emission Evaluation Form
(Make Copies for Future Use For Each Equipment)

Company Name: Hawaiian Commercial and Sugar Company

Equipment monitored and operating load (steam flow):

☐ Boiler 1: _____ Boiler 2: _____

☐ Boiler 3: _____

Fuel: _____

Stack height above ground (ft): _____

Stack distance from observer (ft): _____

Emission color (black or white): _____

Sky conditions (% cloud cover): _____

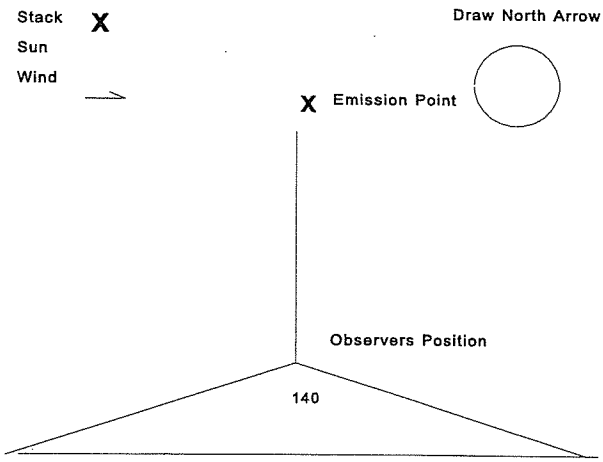
Wind speed (mph): _____

Temperature (°F): _____

Observer Name: _____

Observer Certified? Yes / No

Observation Date and Start Time:_____



SECONDS / MINUTES	0	15	30	45	COMMENTS
1					
2					
3					
4					
5					
6					
Six (6) Minute Average Opacity Reading (%):					

Observation Date and Start Time:_____

SECONDS / MINUTES	0	15	30	45	COMMENTS
1					
2					
3					
4					
5					
6					
Six (6) Minute Average Opacity Reading (%):					

Visible Emission Evaluation Report
(Make Copies for Future Use)

For Period:_____ Date: _____

Facility Name: Hawaiian Commercial and Sugar Company

I certify that I have knowledge of the facts herein set forth, that the same are true, accurate and complete to the best of my knowledge and belief, and that all information not identified by me as confidential in nature shall be treated by Department of Health as public record.

Responsible Official (Print): _____

Title: _____

Responsible Official (Signature) _____

Visible Emissions:
Report the following on the lines provided below all date(s) and six (6) minute average opacity reading(s) which the opacity limit was exceeded during the monthly observations; or if there were no exceedences during the monthly observations, then write no exceedences in the comment column.

EQUIPMENT	SERIAL/ID NO.	DATE	6 MIN. AVER. (%)	COMMENTS

A&B, INC.
HONOLULU

TELEPHONE: (808) 877-2959
FACSIMILE: (808) 871-7663

CN

SEP - 7 2010

HAWAIIAN COMMERCIAL & SUGAR COMPANY
P.O. BOX 266, PUUNENE, MAUI, HAWAII 96784

August 30, 2010

Wilfred K. Nagamine
Manager, Clean Air Branch
State of Hawaii Department of Health
P.O. Box 3378
Honolulu, HI 96801

Subject: Initial Notification of Applicability
National Emission Standards for Hazardous Air Pollutants:
Stationary Reciprocating Internal Combustion Engines,
and
Additional Insignificant Activities
Application for Initial Covered Source Permit No. 0054-01-C
Hawaiian Commercial and Sugar Company, Puunene Mill

Dear Mr. Nagamine:

In accordance with 40 CFR Part 63, §63.6645, enclosed is notification that 40 CFR Part 63, Subpart ZZZZ, National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combustion Engines (the "RICE NESHAP") is applicable to the Hawaiian Commercial and Sugar Company (HC&S) Puunene Mill.

This notification is required for a 113 horsepower diesel irrigation pump located in HC&S sugarcane field 505-1. This unit and six other diesel irrigation pumps then in operation on the HC&S farm had previously been determined *not* to be part of the Puunene Mill or Paia Mill covered sources, and to not require individual non-covered source permits. However, EPA in its response to public comments on the proposed RICE NESHAP explicitly clarified that diesel engines located in contiguous sugarcane fields under common control of HC&S must be considered part of the Puunene Mill major source of hazardous air pollutants (HAPs). Thus, the 113 HP diesel irrigation pump as well as two other diesel irrigation pumps which remain in service and are regulated under the RICE NESHAP (four of the original seven pumps are no longer in service) must all now be considered part of the Puunene Mill major source. Additionally, because the former Paia Sugar Mill and the Kaheka hydroelectric plant are contiguous to and under common control with the Puunene Mill, diesel engines located at these facilities and regulated under the RICE NESHAP are also part of the Puunene Mill major source.

Since each of the diesel engines listed in the attached table are now part of the Puunene Mill major source, HC&S requests to amend its initial covered source permit application to include all of these engines as insignificant activities. Note that two stationary diesel engines already included as insignificant activities in the permit application, the Puunene Mill emergency diesel

generator and the Puunene Mill secondary fire pump, are also subject to 40 CFR Part 63, Subpart ZZZZ.

Should you have any comments or questions regarding this notification, please feel free to contact Sean O'Keefe at (808) 877-2959.

Sincerely,

Anna M. Skrobecki
Senior Vice President
Factory and Power Plant Operations

Enclosure

cc: S. O'Keefe, A&B
G. Rubenstein, Sierra Research

HAWAIIAN COMMERCIAL & SUGAR COMPANY
P.O. BOX 266, PUUNENE, MAUI, HAWAII 96784

DATE

August 30, 2010

Director, Air and Toxics Division
U.S. Environmental Protection Agency, Region 9
75 Hawthorne Street
San Francisco, CA 94105

Subject: Initial Notification of Applicability
National Emission Standards for Hazardous Air Pollutants:
Stationary Reciprocating Internal Combustion Engines

In accordance with 40 CFR Part 63, §63.6645, enclosed is notification that 40 CFR Part 63, Subpart ZZZZ, National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combustion Engines is applicable to the Hawaiian Commercial and Sugar Company (HC&S) Puunene Sugar Mill.

Should you have any comments or questions regarding this notification, please feel free to contact Sean O'Keefe at (808) 877-2959.

Sincerely,

Anna M Skrobecki

Anna M. Skrobecki
Senior Vice President
Factory and Power Plant Operations

Enclosure

cc: S. O'Keefe, A&B
G. Rubenstein, Sierra Research
Hawaii Department of Health, Clean Air Branch

Initial Notification of Applicability

National Emission Standards for Hazardous Air Pollutants:

Stationary Reciprocating Internal Combustion Engines

40 CFR Part 63 Subpart ZZZZ

X Yes, I am subject to 40 CFR Part 63 subpart ZZZZ National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines

NAICS code(s): 111930, 311311

Compliance Date: **X** Existing source: May 3, 2013 ☐ New/reconstructed source: upon initial startup

Note: The May 3, 2013 compliance date for existing sources applies to the following engine types:

- Existing non-emergency compression ignition (CI) stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions
- Existing stationary CI RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions
- Existing stationary CI RICE located at an area source of HAP emissions

Company name: Hawaiian Commercial and Sugar Company

Facility name: Puunene Sugar Mill (including contiguous sugarcane fields and support facilities)

Facility (physical location) address: 1 Hansen Road, Puunene, Maui, Hawaii 96784

My facility is a (please choose one): **X** Major source ☐ Area source

Owner name/title: Hawaiian Commercial and Sugar Company, a division of Alexander & Baldwin, Inc.

Owner/company address: P.O. Box 266 Puunene, Maui, Hawaii 96784

Owner telephone number: (808) 877-2959

Owner email address (if available): sokeefe@hcsugar.com

128

MD 13570

If the Operator information is different from the Owner, please provide the following:

Operator name/title: owner and operator are the same

Operator telephone number: _____

Operator email address (if available): _____

Brief description of the stationary RICE at the facility, including number of engines and the site-rated HP of each engine:

Stationary RICE at the Puunene Sugar Mill major source that are subject to the initial notification requirement under 40 CFR §63.6645 include the following engine:

Deutz Model F6L912 diesel irrigation pump – 113 HP (This unit is portable but is permanently located in HC&S sugarcane field 505-1 and is regulated as an existing stationary engine. Although the field is located approximately four miles from the Puunene Sugar Mill, it is a contiguous facility under common control and is therefore part of the Puunene Sugar Mill major source facility.)

Additional stationary RICE at the Puunene Sugar Mill major source that are NOT subject to the initial notification requirement under 40 CFR §63.6645 (but that are regulated under 40 CFR Part 63 Subpart ZZZZ) include the following engines:

Puunene Sugar Mill emergency diesel generator – 355 HP (This unit is an existing emergency engine.)

Puunene Sugar Mill secondary fire pump – 280 HP (This unit is an existing emergency engine.)

Kaheka hydroelectric plant emergency diesel generator – 107 HP (This unit is an existing emergency engine. Although it is located approximately 6.5 miles from the Puunene Sugar Mill, the Kaheka hydro-electric plant is a contiguous facility under common control and is therefore part of the Puunene Sugar Mill major source facility.)

Old Paia Sugar Mill emergency diesel generator – 66 HP (This unit is an existing emergency engine. Although it is located approximately six miles from the Puunene Sugar Mill, the Old Paia Sugar Mill (now closed) is a contiguous facility under common control and is therefore part of the Puunene Sugar Mill major source faciltiy.)

Old Paia Sugar Mill secondary fire pump – 133 HP (This unit is an existing emergency engine. Although it is located approximately six miles from the Puunene Sugar Mill, the Old Paia Sugar Mill (now closed) is a contiguous facility under common control and is therefore part of the Puunene Sugar Mill major source facility.)

Deutz Model F5L912 diesel irrigation pump – 99 HP (This unit is an existing diesel engine located in HC&S sugarcane field 500-1. Although the field is located approximately five miles from the Puunene Sugar Mill, it is a contiguous facility under common control and is therefore part of the Puunene Sugar Mill major source facility.)

Deutz Model F5L912 diesel irrigation pump – 99 HP (This unit is an existing diesel engine that is

maintained as a spare; however, when placed in service it will be operated as a stationary engine in a sugarcane field that is contiguous to and under common control with the Puunene Sugar Mill. As such, it is part of the Puunene Sugar Mill major source facility.)

I hereby certify that the information presented herein is correct to the best of my knowledge.

Anna M Skrobecki
(Signature)

8-31-2010
(Date)

Anna M. Skrobecki
Senior Vice President,
Factory and Power Plant Operations
(Name/title)

(808) 877-2947
(Telephone No.)

Submit the Initial Notification to one of the following offices, as appropriate:

a. If your State has been delegated the authority for this regulation under section 112(l) of the Clean Air Act[b], submit the notification to your State agency found at the following link: http://www.epa.gov/ttn/atw/area/table_state_contacts.doc

If your state/local contact is not listed at the above link, use this link: http://www.4cleanair.org/contactUsaLevel.asp

b. If your EPA Region has assumed the authority for this rule, submit the notification to your Regional Office of the EPA, from list below:

EPA Region I (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont)
US Environmental Protection Agency
5 Post Office Square, Suite 100, Mail code: OES04-2,
Boston MA 02109-3912 Attention: Air Clerk

EPA Region II (New Jersey, New York, Puerto Rico, Virgin Islands)
Director, Division of Enforcement and Compliance Assistance
290 Broadway, New York, NY 10007-1866

EPA Region III (Delaware, District of Columbia, Maryland, Pennsylvania, Virginia, West Virginia)
Director, Air Protection Division, 1650 Arch Street, Philadelphia, PA 19103

EPA Region IV (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee)
Director, Air, Pesticides and Toxics Management Division
Atlanta Federal Center, 61 Forsyth Street, Atlanta, GA 30303–3104

EPA Region V (Illinois, Indiana, Michigan, Minnesota, Ohio, Wisconsin)
Director, Air and Radiation Division, 77 West Jackson Blvd., Chicago, IL 60604–3507

EPA Region VI (Arkansas, Louisiana, New Mexico, Oklahoma, Texas)
Director, Air, Pesticides and Toxics, 1445 Ross Avenue, Dallas, TX 75202–2733

EPA Region VII (Iowa, Kansas, Missouri, Nebraska)
Director, Air and Waste Management Division, U.S. Environmental Protection Agency
901 N. 5th Street, Kansas City, KS 66101

EPA Region VIII (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming)
Director, Air and Toxics Technical Enforcement Program, Office of Enforcement, Compliance and Environmental Justice, 1595 Wynkoop Street, Denver, CO 80202-1129

EPA Region IX (Arizona, California, Hawaii, Nevada, American Samoa, Guam)
Director, Air and Toxics Division, 75 Hawthorne Street, San Francisco, CA 94105

EPA Region X (Alaska, Idaho, Oregon, Washington)
Director, Office of Air, Waste and Toxics, 1200 6th Ave., Suite 900, AWT-107, Seattle, WA 98101

[b] To determine whether your State has been delegated the authority for this regulation under section 112(l) of the Clean Air Act, contact your EPA Regional Office, listed above.

sierra research

1801 J Street
Sacramento CA 95811
Tel: (916) 444-6666
Fax: (916) 444-8373

Ann Arbor MI
Tel: (734) 761-6666
Fax: (734) 761-6755

September 8, 2010

Wilfred K. Nagamine
Manager, Clean Air Branch
State of Hawaii Department of Health
P.O. Box 3378
Honolulu, HI 96801

Subject: Demonstration of Compliance with Federal 1-hour NO_2 Standard
Application for Initial Covered Source Permit No. 0054-01-C
Hawaiian Commercial and Sugar Company, Puunene Mill

Dear Mr. Nagamine:

On behalf of Hawaiian Commercial & Sugar Company, we are providing the attached demonstration of compliance with the new federal 1-hour average NO_2 standard for the Puunene Mill. The Department of Health asked HC&S to demonstrate compliance of the Puunene Mill with the new 1-hour NO_2 standard prior to issuing the initial CSP for the Puunene Mill. The modeling files are provided on the enclosed CD. The meteorological data files are being submitted under separate cover with a request for confidentiality.

If you have any questions regarding this analysis, please do not hesitate to call.

Sincerely,

Gary Rubenstein

Enclosures

Cc: Sean O'Keefe, A&B

132

MA 13.57

Hawaiian Commercial & Sugar (HC&S) Company Puunene Mill
Air Modeling Analysis
1-Hour NO_2 NAAQS Compliance
September 2010

1. Background

On February 9, 2010, EPA revised the primary nitrogen dioxide (NO_2) National Ambient Air Quality Standard, establishing a new one-hour NO_2 standard to supplement the existing annual standard (75 FR 6473). The new standard became effective on April 12, 2010. The Hawaii Department of Health (HDOH) has asked HC&S to demonstrate compliance of the HC&S Puunene Mill facility with the new 1-hour NO_2 standard prior to issuing the initial CSP for the Puunene mill.

The new one-hour standard is a statistically based standard set at a level of 100 ppb (188 $\mu g/m^3$), based on the 3-year average of the 98th percentile of the yearly distribution of 1-hour daily maximum concentrations, and supplements the existing annual standard.[1]

This modeling analysis follows modeling guidance provided by the U. S. Environmental Protection Agency (EPA) in its "*Guideline on Air Quality Models*" (including supplements) and by HDOH in its requirements for modeling ambient impacts of existing sources for initial CSPs. The analysis also reflects the requirements of the new 1-hour NO_2 NAAQS Final Rule.

2. Emission Sources

The Puunene factory, owned and operated by HC&S, consists of three multifueled steam boilers and three turbine generators, which have a total steam production capacity of approximately 540,000 lb/hr and a total electrical production capacity of approximately 46 MW. Boilers 1 and 2, which are currently permitted to burn bagasse, coal, fuel oil and specification used oil, are Riley spreader stoker units rated at 212 MMBtu/hr each on bagasse. Boilers 1&2 emit through a common stack. Boiler 3, which is also permitted to burn fuel oil, specification used oil and coal as well as bagasse, is a Foster Wheeler spreader stoker unit rated at 568 MMBtu/hr during bagasse firing. All three boilers have valid permits to operate and will continue to operate up to 24 hours per day and 8760 hours per year to provide steam and electricity for the sugar mill, and electricity for sale to the island's utility. The boilers are described in more detail in Attachment 2 to the 2007 revised CSP application.

Emissions calculations are also discussed in detail in the 2007 revised CSP application. The emissions calculations in Attachment 4 to that application show that hourly NOx emissions are highest during coal firing (see Attachment 4b), so the demonstration of compliance with the 1-hour NO_2 standard is based on emissions and stack parameters for coal firing. If compliance is demonstrated under these worst-case emissions conditions, compliance can be expected for other, lower-emitting operating conditions.

---

[1] 75 FR 6474

The NOx emission rates used in this modeling assessment are shown in the following table. As required by HDOH for this demonstration of compliance, these emission rates are based on maximum permitted NOx emissions from each stack during coal firing, rather than on actual boiler emissions, which are lower.

Source	NOx, lb/hr	NOx, g/s
Boilers 1 and 2 (total)	222.7	28.06
Boiler 3	305.9	38.54

Stack parameters were described in detail in the December 2004 modeling analysis (see Attachment 6 to the 2007 CSP application).

3. Model Selection

The 1-hour average NO_2 impacts for the Puunene Mill boilers were evaluated using the AERMOD model with both the Ozone Limiting Method (OLM) and Plume Volume Molar Ratio Method (PVMRM) options. The OLM and PVMRM options within AERMOD may be used to evaluate the ambient conversion of NO to NO2 in the presence of ozone. The two methods use different approaches to determining how much ozone is available for the conversion. Results for both methods are presented in this analysis.

AERMOD is a steady-state, multiple-source, Gaussian dispersion model designed for use with stack emission sources situated in terrain where ground elevations can exceed the stack heights of the emission sources (i.e., complex terrain).[2] The model is capable of estimating concentrations for a wide range of averaging times (from one hour to one year).

Inputs required by AERMOD include the following:

- Model options;
- Meteorological data;
- Source data; and
- Receptor data.

Model options refer to user selections that account for conditions specific to the area being modeled or to the emissions source that needs to be examined. Examples of model options include use of site-specific vertical profiles of wind speed and temperature; consideration of stack and building wake effects; and time-dependent exponential decay of pollutants. The model supplies recommended default options for the user for some of these parameters.

[2] AERMOD was adopted in November 2005 as a guideline model by EPA as a replacement for ISCST3. AERMOD incorporates an improved downwash algorithm as compared to ISCST3 (Federal Register, November 9, 2005; Volume 70, Number 216, Pages 68218-68261).

Ozone Limiting Method

The OLM assumes that at any given receptor location, the amount of NO that is converted to NO_2 is proportional to the ambient O_3 concentration:

- If the O_3 concentration is less than the NO concentration, the amount of NO_2 formed by this reaction is limited.
- If the O_3 concentration is greater than or equal to the NO concentration, all NO is assumed to be converted to NO_2.
- In addition, OLM ignores the photo-dissociation of NO_2 in the presence of sunlight and the reactions of NO with reactive hydrocarbons.

Moreover, there are two possible modes that can be used for applying OLM to multiple source scenarios within AERMOD: (1) apply OLM to each source separately and assume that each source has all of the ambient ozone available for conversion of NO to NO_2; or (2) assume that sources whose plumes overlap compete for the available ozone and apply OLM on a combined plume basis (implemented using the OLMGROUP keyword). The general guidance has been that the OLM option should be applied on a source-by-source basis. However, application of the OLMGROUP option within AERMOD is such that the sources compete for the available ozone only to the extent that each source contributes to the cumulative NOx concentration at each receptor for that hour; therefore, the OLMGROUP option implemented in AERMOD will tend to be "self-correcting" with respect to concerns that combining plumes for OLM will overestimate the degree of ozone limiting potential (and therefore underestimate ambient NO_2 concentrations). Further, an examination of the modeling results indicates that the exhaust plumes from the two boiler stacks have their maximum impacts at essentially the same location, indicating that the plumes physically overlap and combine to a large extent after they leave the exhaust stacks. Therefore, use of the OLMGROUP option is appropriate for this analysis. Following EPA guidance,[3] the "OLMGROUP ALL" option, which specifies that all sources will potentially compete for the available ozone, has been used in this analysis.

Plume Volume Molar Ratio Method

Like OLM, PVMRM determines the conversion rate for NOx to NO_2 based on a calculation of the moles of NOx emitted into the plume and the moles of O_3 contained within the volume of the plume between the source and receptor. The dispersion algorithms in AERMOD and other steady-state plume models are based on the use of total dispersion coefficients, which are formulated to represent the time-averaged spread of the plume. However, Cole and Summerhays[4] have suggested that a more appropriate definition of the volume of the plume for purposes of determining the ozone moles available for conversion of NOx is based on the instantaneous volume of the plume, which is represented by the use of relative dispersion

---

[3] EPA Memorandum on *Applicability of Appendix W Modeling Guidance for the 1-hour NO2 National Ambient Air Quality Standard,* dated 6/28/2010 (http://www.epa.gov/ttn/scram/ClarificationMemo_AppendixW_Hourly-NO2-NAAQS_FINAL_06-28-2010.pdf)

[4] Cole, H.S. and J.E. Summerhays, 1979. *A Review of Techniques Available for Estimation of Short-Term NO2 Concentrations*. Journal of the Air Pollution Control Association, 29(8): 812–817

coefficients. The implementation of PVMRM in AERMOD is based on the use of relative dispersion coefficients to calculate the plume volume.

Key model inputs for both OLM and PVMRM are the in-stack ratios of NO_2/NOx emissions and background ozone concentrations, because these factors limit the amount of emitted NOx that can be converted to NO_2 in the modeling analysis. For this analysis, an in-stack NO_2/NOx ratio of 0.1 was used. Several studies indicate that the fraction of NO_2 in boiler exhaust is between 0 and 10%.[5,6] The higher end of the range, 10%, was used for this analysis to provide a conservatively high estimate of NO_2 impacts. The selection of background ozone concentrations is discussed in Section 6 below.

4. Receptor Grid Selection and Coverage

Receptor and source base elevations were determined from USGS Digital Elevation Model (DEM) data using the 7½-minute format (10-meter spacing between grid nodes). All coordinates were referenced to UTM North American Datum 1983 (NAD83), Zone 4. The AERMOD receptor elevations were interpolated among the DEM nodes according to standard AERMAP procedure.

Cartesian coordinate receptor grids were used to provide adequate spatial coverage surrounding the project area for assessing ground-level pollution concentrations and to identify maximum impact locations. A 250-meter resolution coarse receptor grid was developed, which extends outwards at least 10 kilometers (km) from the location of the CT2 stack. In addition, more refined nested grids were developed to efficiently identify the maximum impact areas. These nested grids had the following resolutions:

- 25-meter resolution along the facility fence line in a single tier of receptors composed of four segments extending out to 100 meters from the fence line; and
- 25-meter resolution covering areas west and south of the facility—from the western facility boundary to a distance of 3 km; and from 1.1 km south to 1.9 km north of the facility.

5. Meteorological Data

The on-site meteorological data collected by HC&S at Puunene during 2002-2003 have been processed, using AERMET (Version 06341), into the format required by AERMOD. The Puunene monitoring station was located approximately 0.8 miles (1.3 km) south-southeast of the Puunene Mill. Upper air data from the Lihue Airport monitoring station, located approximately 323 km north-northwest of the facility, were used with the surface data from Puunene in creating the model-ready data set.

---

[5] Cleaver Brooks, "Boiler Emissions Reference Guide," Second Edition, p. 11.

[6] Golden, Stephen J. et al, "Reactor system for reducing NOx emissions from boilers," (abstract of patent application), accessed at http://www.faqs.org/patents/app/20080279741.

The surface characteristics appropriate to the land uses surrounding the meteorological station have been developed following EPA's most recent guidance.[7] The surface characteristics used in the December 2004 ambient air quality analysis were developed following earlier EPA guidance that evaluated the area within 3 miles of the met station. Because of the consistency in surface characteristics in the area surrounding the met station site and the Puunene mill, implementation of the change in EPA guidance from a 3-mile to a 1-mile radius did not result in any changes in the resulting values for roughness, Bowen ratio, or albedo

EPA requires the use of meteorological data that would be representative of atmospheric dispersion conditions at the source and at locations where the source may have a significant impact on air quality. The on-site meteorological data collected at Puunene monitoring station from February 1, 2002, to January 31, 2003, are representative of meteorological conditions at the facility and were collected in accordance with the requirements of the EPA On Site Meteorological Program Guidance for Regulatory Model Applications (EPA 450/4 87 013, August 1995).

6. Ambient Air Quality Data

As discussed above, modeling hourly NO_2 concentrations using either the OLM or PVMRM methods requires hourly ozone data to ozone-limit the hourly NOx concentrations otherwise modeled by AERMOD. Hourly ozone data collected at Sand Island in 2009 were used, as the Sand Island monitoring station is located on the island of Oahu, predominantly downwind of the Honolulu metropolitan area, and is the only location in the state that collects ozone data. The Sand Island station is located in an urban area and its monitoring objective is to obtain the highest concentration of ozone in the area. By using ozone concentrations that are expected to be higher than those in the vicinity of the Puunene mill, this analysis will overestimate modeled ambient NO_2 concentrations because higher ozone concentrations allow more conversion of NO to NO_2. A default ozone concentration of 40 ppb was used to fill in for missing hourly ozone readings. This value is conservative because it is a level more typical of rural continental areas; remote tropospheric ozone levels are more typically in the range of 30 ppb.

Computation of total hourly NO_2 concentrations also requires information about existing background concentrations. For this analysis, ambient NO_2 concentrations from the Ko'olina Golf Course monitoring station on Oahu in 2009 were used to represent existing background NO_2 concentrations in the vicinity of Puunene mill. Like the Sand Island monitoring station, Ko'olina is predominantly downwind of the Honolulu metropolitan area. Based on EPA guidance related to determinations of compliance with the new 1-hour average NO_2 NAAQS,[8] 75% of hourly NO_2 readings are required to constitute a valid monitoring day. The 2009 Ko'olina NO_2 dataset had 329 valid monitoring days.

---

[7] EPA, "AERMOD Implementation Guide", 2008. Although EPA has developed AERSURFACE (Version 08009) software (released on January 9, 2008) to prepare met data sets for use in AERMOD, AERSURFACE has not been developed for Hawaii.

[8] Federal Register, Volume 75, Number 26, Part III, Environmental Protection Agency, 40 CFR Parts 50 and 58, *Primary National Ambient Air Quality Standards for Nitrogen Dioxide; Final Rule,* Appendix S, pages 6532-6533, February 9, 2010.

7. Combining Existing Ambient Air Quality Data with Modeled Impacts

As discussed above, the AERMOD OLM and PVMRM methods were used to determine how much of the NO emitted from the exhaust stacks is converted to NO_2 by the time it reaches the ground. AERMOD OLM/PVMRM calculates the NO_2 concentration for each hour using hourly ozone data. The modeled NO_2 concentration for each receptor and each hour (which consists of the 10% of the NOx that is directly emitted as NO_2 plus the fraction of NO that is converted to NO_2 between the time the plume leaves that stack and the time it impacts a receptor) is added to the monitored background NO_2 concentration for the corresponding hour to calculate total ambient NO_2 during that hour.[9] The 98th percentile of the maximum daily 1-hour values is determined for comparison with the 1-hour NO_2 standard using the procedure outlined below, in accordance with the requirements of the final rule.

- AERMOD calculates the NO_2 concentration for each hour of meteorological data and using OLM or PVMRM and hourly ozone concentrations to limit the formation of NO_2. The DAYTABLE option in AERMOD is used to store the hourly concentrations at each receptor for the entire modeled period.

- The predicted total hourly NO_2 concentration at each receptor is calculated by adding the modeled hourly NO_2 impact at the receptor to the NO_2 concentration measured at the Ko'olina Golf Course monitoring station for the corresponding hour using a FORTRAN postprocessor.

- The postprocessor selects the highest total 1-hour daily value for each receptor for each calendar day, and these highest daily values are sorted from highest to lowest for each receptor. Based on the number of valid daily values and EPA guidance,[10] the 98th percentile value is selected for comparison with the standard. Because there were 329 valid days in the background NO_2 dataset, the 7th highest value is the 98th percentile value for this analysis.

8. Results

The 1-hour NO_2 NAAQS is 100 parts per billion by volume (ppb), based on a 3-year average of the 98th percentile of the highest daily 1-hour concentrations. The NAAQS level of 100 ppb is equivalent to 188 $\mu g/m^3$, and the analysis procedure described above was conducted in units of $\mu g/m^3$. Hourly monitoring concentrations are calculated, rounded and reported to the nearest whole number, following regulatory guidance.[11] Because only one year of meteorological data is

---

[9] The meteorological data and the ozone and NO_2 ambient data are matched by hour (that is, January 1, 1 a.m.; January 1, 2 a.m., etc). While the ozone and NO_2 ambient data are concurrent (both from 2009), the meteorological data was collected in 2002/3.

[10] Federal Register, Volume 75, Number 26, Part III, Environmental Protection Agency, 40 CFR Parts 50 and 58, *Primary National Ambient Air Quality Standards for Nitrogen Dioxide; Final Rule,* Appendix S, Table 1, p. 6534. February 9, 2010.

[11] Ibid, page 6533.

available for the Puunene mill, the 3-year averaging cannot be performed and the highest 98th percentile value is used to determine compliance.

The highest 98th percentile value of the highest daily 1-hour concentrations at any receptor is 168 $\mu g/m^3$, modeled using OLM, and 186 $\mu g/m^3$, modeled using PVMRM. These modeled concentrations include background, as discussed above. Both results are lower than the one-hour NO_2 NAAQS of 188 $\mu g/m^3$. It should be noted that these modeled results are based on very conservative assumptions regarding background concentrations and emission rates, and therefore conservatively overestimate actual ambient NO_2 impacts from the facility. These results demonstrate that even using these worst-case assumptions, the HC&S Puunene Mill boilers will not cause or contribute to an exceedance of the new 1-hour NO_2 NAAQS.

A&B, INC.
HONOLULU

TELEPHONE: (808) 877-2959
FACSIMILE: (808) 871-7663

JUN 28

POSTMARKED JUN 24 2011 DATE

HAWAIIAN COMMERCIAL & SUGAR COMPANY

P.O. BOX 266, PUUNENE, MAUI, HAWAII 96784

June 24, 2011

Mr. Wilfred Nagamine
Clean Air Branch
State of Hawaii Department of Health
P.O. Box 3378
Honolulu, HI 96801

Subject: **Maximum Potential to Emit Greenhouse Gases,**
Hawaiian Commercial and Sugar Company Puunene Sugar Mill

Dear Mr. Nagamine:

As requested by Mr. Nolan Hirai of your staff, attached are estimates for the Puunene Sugar Mill boilers of their maximum potential to emit greenhouse gases. Emission factors used in preparing the estimates are from 40 CFR Part 98.

Please feel free to contact me at (808) 877-2959 if you have any questions regarding these estimates.

Sincerely,

Sean M. O'Keefe
Director, Environmental Affairs
Alexander & Baldwin, Inc.
For its division, Hawaiian Commercial and Sugar Company

cc: A. Skrobecki, HC&S
G. Rubenstein, Sierra Research

HC&S Puunene Mill Boilers
GHG Potential to Emit

	Emissions, Mg/yr			
	CO_2	CH_4	N_2O	CO_2e
Highest Overall GHG Emissions: 100% biomass (bagasse) operation				
Boilers 1 and 2	438,911.7	59.4	7.8	442,577.7
Boiler 3	587,976.1	159.2	20.9	597,798.1
Total	1,026,887.8	218.6	28.7	1,040,375.8
Total biogenic emissions	1,026,887.8	218.6	28.7	1,040,375.8
Total excluding biogenic CO_2	0.0	218.6	28.7	247.3
Highest GHG Emissions with Fossil Fuel Firing: bagasse/oil/coal (Boilers 1 and 2) and bagasse/coal (Boiler 3) operation				
Boilers 1 and 2	353,827.5	69.4	9.4	358,202.2
Boiler 3	490,549.9	131.3	17.4	498,696.0
Total	844,377.3	200.7	26.8	856,898.2
Total biogenic emissions	451,049.1	176.7	23.2	458,583.7
Total excluding biogenic CO_2	393,328.3	200.7	26.8	393,555.8

Notes:
1. Propane used as an oil burner ignition fuel contributes insignificant emissions so is not included here.
2. Mg = megagrams = metric tons

Calculation of GHG Potential to Emit: Boiler 3
HC&S Puunene Mill

Fuel	Hourly Heat Input (MMBtu)	Emission Factor (kg/MMBtu) (1)			Emissions, kg/hr		
		CO_2	CH_4	N_2O	CO_2	CH_4	N_2O
Bagasse	568	118.17	3.2E-02	4.2E-03	67,120.56	18.18	2.39
Spec oil	392	74.00	3.0E-03	6.0E-04	29,008.00	1.18	0.24
#2 oil	392	73.96	3.0E-03	6.0E-04	28,992.32	1.18	0.24
Coal	437	93.40	1.1E-02	1.6E-03	40,815.80	4.81	0.70
Wood chips	568	93.80	3.2E-02	4.2E-03	53,278.40	18.18	2.39
GWP (2)					1	21	310

References:

1. Emission factors from 40 CFR Part 98, Tables C-1 and C-2 to Subpart C.
2. Global warming potentials (GWP) from 40 CFR Part 98, Table A-1 to Subpart A.

Based on 8760 hrs/hr of operation and 50% biomass requirement, allowable fuel combinations would be:

Scenario	Fuel	Hrs/yr	MMBtu/yr	% of Btus	Emissions, Mg/yr			
					CO_2	CH_4	N_2O	CO_2e
1	Bagasse	3577	2,031,736	50.0%	240,090.2	65.0	8.5	
	#2 oil	5004	1,961,568	48.3%	145,077.6	5.9	8.0	
	Spec oil	179	70,168	1.7%	5,192.4	0.2	0.0	
	Total		4,063,472		390,360.2	71.1	16.6	396,991.9
2	Wood chips	3577	2,031,736	50.0%	190,576.8	65.0	8.5	
	#2 oil	5183	2,031,736	50.0%	150,348.5	6.1	1.2	
	Total		4,063,472		340,925.3	71.1	9.8	345,441.8
3	Bagasse	6674	3,791,031	80.6%	447,986.1	121.3	15.9	
	#2 oil	0	-	0.0%	0.0	0.0	0.0	
	Coal	2086	911,430	19.4%	42,563.8	10.0	1.5	
	Total		4,702,461		490,549.9	131.3	17.4	498,696.0
4	Bagasse	3674	2,087,031	50.0%	246,624.4	66.8	8.8	
	#2 oil	3000	1,176,000	28.2%	87,024.0	3.5	0.7	
	Coal	2086	911,430	21.8%	42,563.8	10.0	1.5	
	Total		4,174,461		376,212.2	80.3	10.9	381,287.4
5	Wood chips	3674	2,087,031	50.0%	195,763.5	66.8	8.8	
	#2 oil	3000	1,176,000	28.2%	87,024.0	3.5	0.7	
	Coal	2086	911,430	21.8%	85,127.6	10.0	1.5	
	Total		4,174,461		367,915.1	80.3	10.9	372,990.3
6	Bagasse	8760	4,975,680	100%	587,976.1	159.2	20.9	597,798.1
7	Wood chips	8760	4,975,680	100%	466,718.8	159.2	20.9	476,540.8

	Emissions, Mg/yr			
	CO_2	CH_4	N_2O	CO_2e
MAX Mg/yr, biomass only: 100% bagasse	587,976.1	159.2	20.9	
CO_2e	587,976.1	3,343.7	6,478.3	597,798.1
MAX Mg/yr, fossil fuel + biomass: bagasse and coal	490,549.9	131.3	17.4	
Total CO_2e	490,549.9	2,758.1	5,388.0	498,696.0
CO_2e from biomass	246,624.4	1,402.5	2,717.3	250,744.2

Notes:

1. Annual coal use in Boiler 3 limited to 45,000 tpy. At 10,127 Btu/lb (consistent with heat content used in previous criteria pollutant PTE calculations), this is equivalent to 911,430 MMBtu per year of coal.
2. Annual cooking oil use in Boiler 3 is limited to 1 MMgal/yr. At 5.2 MMBtu/bbl (consistent with heat content used in previous criteria pollutant PTE calculations), this is equivalent to 123,810 MMBtu/yr of cooking oil. No emission factors are available for this fuel, so it is not included in the calculations.
3. Per Note 2 for Boilers 1 and 2, assume Boiler 3 uses 0.5 MM gallons per year of spec used oil, equivalent to 70,238 MMBtu/yr

Calculation of GHG Potential to Emit: Boilers 1 and 2
HC&S Puunene Mill

Fuel	Hourly Heat Input (MMBtu)	Emission Factor (kg/MMBtu)			Emissions, kg/hr per boiler		
		CO_2	CH_4	N_2O	CO_2	CH_4	N_2O
Bagasse	212	118.17	3.2E-02	4.2E-03	25,052.0	6.78	0.89
Spec used oil	173	74.00	3.0E-03	6.0E-04	12,802.0	0.52	0.10
#2 Oil	173	73.96	3.0E-03	6.0E-04	12,795.1	0.52	0.10
Coal	192	93.40	1.1E-02	1.6E-03	17,932.8	2.11	0.31
Wood chips	212	93.80	3.2E-02	4.2E-03	19,885.6	6.78	0.89
GWP (2)					1	21	310

References:

1. Emission factors from 40 CFR Part 98, Tables C-1 and C-2 to Subpart C.
2. Global warming potentials (GWP) from 40 CFR Part 98, Table A-1 to Subpart A.

Based on 8760 hrs/hr of operation and 50% biomass requirement, allowable fuel combinations would be:

Scenario	Fuel	Hrs/yr	MMBtu/yr	% of Btus	Emissions, Mg/yr per boiler			
					CO_2	CH_4	N_2O	CO_2e
1	Bagasse	3937	834,644	50.0%	98,629.9	26.7	3.5	
	#2 oil	4417	764,141	45.8%	56,515.9	2.3	0.5	
	Spec used oil	406	70,238	4.2%	5,197.6	0.2	0.0	
	Total		1,669,023		160,343.4	29.2	4.0	162,198.7
2	Wood chips	3937	834,644	50.0%	78,289.6	26.7	3.5	
	#2 oil	4417	764,141	45.8%	56,515.9	2.3	0.5	
	Spec used oil	406	70,238	4.2%	5,197.6	0.2	0.0	
	Total		1,669,023		140,003.1	29.2	4.0	141,858.4
3	Bagasse	4080	864,960	50.0%	102,212.3	27.7	3.6	
	#2 oil	1390	240,455	13.9%	17,784.1	0.7	0.1	
	Spec used oil	406	70,238	4.1%	5,197.6	0.2	0.0	
	Coal	2884	553,744	32.0%	51,719.7	6.1	0.9	
	Total		1,729,398		176,913.7	34.7	4.7	179,101.1
4	Bagasse	8760	1,857,120	100%	219,455.9	29.7	3.9	221,288.8
5	Wood chips	8760	1,857,120	100%	174,197.9	29.7	3.9	176,030.8

	Emissions, Mg/yr (total, 2 boilers)			
	CO_2	CH_4	N_2O	CO_2e
MAX Mg/yr, biomass only: 100% bagasse, 2 boilers	438,911.7	59.4	7.8	
CO_2e	438,911.7	1,248.0	2,418.0	442,577.7
MAX Mg/yr, fossil fuel + biomass: bagasse, oil and coal, 2 boilers	353,827.5	69.4	9.4	
Total CO_2e	353,827.5	1,457.5	2,917.2	358,202.2
CO_2e from biomass	204,424.6	1,162.5	2,252.4	207,839.5

Notes:

1. Annual coal use in Boilers 1&2 limited to 54,680 tpy. At 10,127 Btu/lb (consistent with heat content used in previous criteria pollutant PTE calculations), this is equivalent to
   553,744 MMBtu per year of coal per boiler.
2. Annual spec used oil use in all three boilers is limited to 1.5 MMgal/yr. Assume 1 MM gal is used in Boilers 1 and 2; 0.5 MM gal in Boiler 3. At 5.9 MMBtu/bbl (consistent with heat content used in previous criteria pollutant PTE calculations), this is equivalent to
   70,238 MMBtu per year of spec used oil per boiler.