

PROPOSED

Temporary Covered Source Permit Review Summary (Renewal)

Application File No.: 0467-03

Permit No.: 0467-01-CT

Applicant: Hawaiian Dredging Construction Company

Facility Title: Portable 1500 TPH Stone Quarrying and Processing Plant with 810 hp Diesel Engine Generator

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Application Date: Received on April 1, 2009

Proposed Project:

The Standard Industrial Classification (SIC) Code is 1442 under *Construction Sand and Gravel*.

This application is for the renewal of Temporary Covered Source Permit (CSP) No. 0467-01-CT for a portable 1500 TPH stone quarrying and processing plant. A check for \$500.00 was also submitted by the applicant for a renewal of a temporary covered source permit (non-air toxic) and processed.

This stone quarrying and processing plant processes raw material, consisting of basalt rock or concrete. Material to be crushed is loaded into the grizzly feeder of the Cedarapids 3054 jaw crusher by a front end loader. If concrete with rebars are to be crushed, a magnet located at the end of the conveyor belt no. 1 removes the metal from the crushed rock. From conveyor no. 1, the material is transferred to conveyor belt no. 2, which transports it onto a surge pile. A tunnel conveyor belt no. 3 moves the material from the surge pile to conveyor belt no. 4. A second magnet situated at the end of conveyor belt no. 3 removes any remaining metal pieces and/or rebar. Conveyor belt no. 4 moves the material into the top screen of the 3-deck Cedarapids 6203-38 screen. Oversize material from the top screen is crushed again by the Cedarapids MVP 380 rollercone crusher. The crushed material exits by a chute onto conveyor belt no. 5, which returns it to conveyor belt no. 3 in a closed loop. The material from the middle screen travels on conveyor belt no. 6 to the radial stacker no. 7 onto a stock pile. Material from the bottom screen is moved on conveyor belt no. 8 onto a stock pile.

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Electricity for the plant is supplied by a 810 hp diesel engine generator. Diesel fuel is stored in a 600 gallon diesel fuel tank.

Equipment Description:

Portable 1500 TPH Stone Quarrying and Processing Plant

1. One (1) 52" x 20' Cedarapids Vibrating Grizzly Feeder, Model No. 5220VGF, Serial No. 50814, manufacturing date - 2000, electric powered;
2. One (1) 1500 TPH Cedarapids Primary Jaw Crusher, Model No. 3054, Serial No. 50764, manufacturing date - 2000, electric powered;
3. One (1) 380 TPH Cedarapids Cone Crusher, Model No. RC54, Serial No. 2310792, manufacturing date - 2000, electric powered;
4. One (1) 5' x 16' Cedarapids 3-Deck Screen, Model No. 5163-26, Serial No. 34C1492, manufacturing date - 2000, electric powered;
5. Radial Stacker and Miscellaneous Conveyors;
6. Waterspray system consisting of thirteen (13) waterspray bars located throughout the plant as indicated in the Air Pollution Control Section below;
7. One (1) 810 hp Caterpillar Diesel Engine Generator, Model No. 3412DI, Serial No. 81Z09827, fired on diesel fuel no. 2, max. fuel consumption rate - 39.9 gal/hr, stack parameters - diameter = 0.3048 m, height = 6.4 m, exhaust temp.= 750 deg K, exhaust flow = 2.165 m³/s, velocity = 29.671 m/s

Air Pollution Controls:

1. Maximum sulfur content of the diesel fuel no. 2 fired in the diesel engine generator shall not exceed 0.5% by weight. Compliance with 40 CFR Part 63, Subpart ZZZZ by May 3, 2013, will utilize ultralow sulfur fuel oil (0.0015% by weight) for SO₂ reduction and an oxidation catalyst for CO reduction.
2. The stone quarrying and processing plant is equipped with water sprays to control fugitive dust. Water sprays are located at crushers, screen, transfer points, material drop off points and stockpiles.
3. Stockpiles, crushing area and unpaved access roads are controlled by means of a water truck.

Applicable Requirements:

Hawaii Administrative Rules (HAR)

Title 11, Chapter 59	Ambient Air Quality Standards
Title 11, Chapter 60.1	Air Pollution Control
Subchapter 1	General Requirements
Subchapter 2	General Prohibitions

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HAR 11-60.1-31	Applicability
HAR 11-60.1-32	Visible Emissions
HAR 11-60.1-33	Fugitive Dust
HAR 11-60.1-38	Sulfur Oxides from Fuel Combustion
Subchapter 5	Covered Sources
Subchapter 6	Fees for Covered Sources, Noncovered Sources, and Agricultural Burning
HAR 11-60.1-111	Definitions
HAR 11-60.1-112	General Fee Provisions for Covered Sources
HAR 11-60.1-113	Application Fees for Covered Sources
HAR 11-60.1-114	Annual Fees for Covered Sources
Subchapter 8	Standards of Performance for Stationary Sources
HAR 11-60.1-161	New Source Performance Standards
Subchapter 9	Hazardous Air Pollution Sources
HAR 11-60.1-174	Maximum Achievable Control Technology (MACT) Emission Standards

Federal Requirements

40 CFR Part 60 - Standards of Performance for New Stationary Sources (NSPS)

Subpart A: General Provisions

Subpart OOO: Standards of Performance for Nonmetallic Mineral Processing Plants

40 CFR Part 63 - National Emission Standards for Hazardous Air Pollutants for Source Categories (Maximum Achievable Control Technologies (MACT) Standards)

Subpart A: General Provisions

Subpart ZZZZ: National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines. (RICE NESHAP)

Non-applicable Requirements:

Hawaii Administrative Rules (HAR)

Title 11, Chapter 60.1 Air Pollution Control

Subchapter 7 Prevention of Significant Deterioration Review

Federal Requirements

40 CFR Part 52.21 - Prevention of Significant Deterioration of Air Quality

40 CFR Part 61 - National Emission Standards for Hazardous Air Pollutants (NESHAP)

Best Available Control Technology (BACT):

A Best Available Control Technology (BACT) analysis is required for new covered sources or significant modifications to covered sources that have the potential to emit or increase emissions above significant levels as defined in HAR §11-60.1-1. There are no proposed changes for this renewal application. Therefore, a BACT analysis is not required for this permit renewal.

Prevention of Significant Deterioration (PSD):

This source is not a major stationary source nor are there modifications proposed that by itself constitute a major stationary source that is subject to PSD review. Therefore, PSD is not applicable.

Consolidated Emissions Reporting Rule (CERR):

40 CFR Part 51, Subpart A - Emission Inventory Reporting Requirements, determines CER based on the emissions of criteria air pollutants from Type B point sources (as defined in 40 CFR Part 51, Subpart A), that emit at the CER triggering levels as shown in the table below.

Pollutant	Type B CER Triggering Levels ¹ (tpy)	Pollutant	In-house Total Facility Triggering Levels ² (tpy)	Total Facility Emissions ² (tpy)
NO _x	≥100	NO _x	≥25	18.19
SO ₂	≥100	SO ₂	≥25	2.90
CO	≥1000	CO	≥250	4.83
PM ₁₀ /PM _{2.5}	≥100/100	PM/PM ₁₀	≥25/25	PM=41.57, PM ₁₀ =14.08 PM _{2.5} =2.17
VOC	≥100	VOC	≥25	0.51
		HAPS	≥5	2.44 E-02

¹ Based on actual emissions

² Based on potential emissions

This facility does not emit at the CER triggering levels. Therefore, CER requirements are not applicable.

Although CER for the facility is not triggered, the Clean Air Branch requests annual emissions reporting from those facilities that have *facility-wide* emissions of a single air pollutant exceeding in-house triggering levels. Since the total emissions of PM within the facility is greater than twenty-five (25) tons per year, annual emissions reporting for the 810 hp diesel engine generator and the stone processing plant will be required for in-house recordkeeping purposes.

Compliance Assurance Monitoring (CAM):

40 CFR Part 64

Applicability of the CAM rule is determined on a pollutant specific basis for each affected emission unit. Each determination is based upon a series of evaluation criteria. In order for a source to be subject to CAM, each source must:

- Be located at a major source per Title V of the Clean Air Act Amendments of 1990;
- Be subject to federally enforceable applicable requirements;
- Have pre-control device potential emissions that exceed applicable major source thresholds;

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- Be fitted with an “active” air pollution control device; and
- Not be subject to certain regulations that specifically exempt it from CAM.

Emission units are any part or activity of a stationary source that emits or has the potential to emit any air pollutant.

This source is not subject to Compliance Assurance Monitoring (CAM) since this facility is not a major source required to obtain a Part 70 permit.

Synthetic Minor Source:

This facility is a synthetic minor source as the facility would be classified as a major source *without* operational limitations (i.e., operating at 8760 hrs/year), however, is classified as a non-major source through the use of operational restrictions of 2080 hrs/yr for the 810 hp diesel engine generator and an annual production limit of 1,000,000 tons per year for the 1500 TPH primary jaw crusher.

Insignificant Activities:

1. *Per HAR 11-60.1-82(f)(1)*
One (1) 600 gallon diesel fuel tank

Alternate Operating Scenarios:

The applicant proposed the following alternate operating scenario be added to the renewal permit:

The permittee may replace the diesel engine generator with a temporary replacement unit if any repair work (i.e., equipment failure, engine overhaul, or any major equipment problems requiring maintenance for efficient operation) reasonably warrants the removal of the diesel engine generator from its site.

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Project Emissions:

- Emissions for 810 hp diesel engine generator** - Calculated at 2080 hrs/yr at a maximum fuel consumption rate of 39.9 gal/hr. Project emissions are based on before 40 CFR Part 63, Subpart ZZZZ takes effect.

Example: $\text{tpy} = \text{EF} \times (137,000 \text{ Btu/gal}) \times (39.9 \text{ gal/hr}) \times (1 \text{ MMBtu} / 1,000,000 \text{ Btu}) \times (2080 \text{ hrs/yr}) \div (2000 \text{ lb/ton})$

Pollutant	Emission Factors (lb/MMBtu)	Emission Rate (lb/hr)	Controlled Annual Emissions (tpy) (@ 2080 hrs/yr)
NO _x	3.2	17.49	18.19
CO	0.85	4.65	4.83
SO ₂	0.51	2.79	2.90
PM	0.0697	0.38	0.40
PM ₁₀	0.0573	0.31	0.33
PM _{2.5}	0.0479	0.26	0.27
VOC	0.09	0.49	0.51
Benzene	7.76 E-04	4.24 E-03	4.41 E-03
Toluene	2.81 E-04	1.54 E-03	1.60 E-03
Xylenes	1.93 E-04	1.05 E-03	1.10 E-03
Propylene	2.79 E-03	1.53 E-02	1.59 E-02
Formaldehyde	7.89 E-05	4.31 E-04	4.49 E-04
Acetaldehyde	2.52 E-05	1.38 E-04	1.43 E-04
Acrolein	7.88 E-06	4.31 E-05	4.48 E-05
Naphthalene	1.30 E-04	7.11 E-04	7.39 E-04
HAPS			2.44 E-02

Emission factors from AP-42 (10/96), Table 3.4-1. Gaseous Emission Factors for Large Stationary Diesel and All Stationary Dual-Fuel Engines; Table 3.4-2. Particulate and Particle-Sizing Emission Factors for Large Uncontrolled Stationary Diesel Engines; Table 3.4-3. Speciated Organic Compound Emission Factors for Large Uncontrolled Stationary Diesel Engines; and Table 3.4-4. PAH Emission Factors for Large Uncontrolled Stationary Diesel Engines.

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2. **Emissions for Stone Processing Operations** - Calculations based on 1500 TPH maximum processing rate at a maximum of 1,000,000 tons per year using watersprays for controls.

Source	Pollutant	Emission Factors ⁴ (lb/ton)	Emission Rate (lb/hr)	Controlled Annual Emissions (tpy)
Primary crushing (controlled)	PM _{2.5}	0.00072 ¹	1.08	0.36
	PM ₁₀	0.00072 ¹	1.08	0.36
	PM	0.0016 ¹	2.40	0.80
Secondary crushing (controlled)	PM _{2.5}	0.00072 ¹	1.08	0.36
	PM ₁₀	0.00072 ¹	1.08	0.36
	PM	0.0016 ¹	2.40	0.80
Screening (controlled)	PM _{2.5}	0.00005 ¹	0.075	0.025
	PM ₁₀	0.0026 ¹	3.90	1.30
	PM	0.0075 ¹	11.25	3.75
Conveyor transfer points (controlled) (13 transfer points)	PM _{2.5}	1.3 E-05 ¹	0.02	0.007(13) = 0.085
	PM ₁₀	0.00033 ¹	0.50	0.17(13) = 2.15
	PM	0.00090 ¹	1.35	0.45(13) = 5.85
Truck unloading: fragmented stone	PM _{2.5}	0.000005 ¹	0.0075	0.0025
	PM ₁₀	0.000016 ¹	0.024	0.008
	PM	0.000031 ¹	0.0465	0.0155
Truck loading-conveyor: crushed stone	PM _{2.5}	0.00003 ¹	0.045	0.015
	PM ₁₀	0.00010 ¹	0.150	0.050
	PM	0.00020 ¹	0.30	0.10
Wind erosion: storage piles	PM _{2.5}	0.002 ²		0.30
	PM ₁₀	0.013 ²	-----	1.95
	PM	0.028 ²	-----	4.20
Vehicle traffic: unpaved roads	PM _{2.5}	0.40 lb/VMT ³		0.75
	PM ₁₀	4.04 lb/VMT ³	-----	7.57
	PM	13.68 lb/VMT ³	-----	25.65
Total	PM _{2.5}			1.9
	PM ₁₀			13.75
	PM			41.17

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¹ Emission factors from AP-42, Table 11.19.2-2. Emission Factors for Crushed Stone Processing Operations (8/04). Controlled emission factors were calculated using uncontrolled emission factors with a control efficiency of 70%. PM_{2.5} derived using AP-42, Appendix B.2 (9/90), Table B.2.2, Category 3.

² Emission factors from AP-42, Section 13.2.4. Aggregate Handling and Storage Piles (11/06)

$$E = k(0.0032) \times [(U/5)^{1.3} / ((M/2)^{1.4})]$$

E = emission factor (lb/ton)

k = particle size multiplier (dimensionless) = 0.053 (PM_{2.5}), 0.35 (PM₁₀), 0.74 (PM)

U = mean wind speed (mph) = 10.9 (state avg.)

M = material moisture content (%) = 0.7

control efficiency = 70%, assuming a watertruck for stockpiles

³ Emission factors from AP-42, Section 13.2.2. Unpaved Roads (11/06)

$$E = k \times (s/12)^a \times (W/3)^b$$

E = size-specific emission factor (lb/VMT)

k = constant (lb/VMT) = 0.15 (PM_{2.5}), 1.5 (PM₁₀), 4.9 (PM)

a = 0.9 (PM_{2.5}), 0.9 (PM₁₀), 0.7 (PM)

b = 0.45 (PM_{2.5}), 0.45 (PM₁₀), 0.45 (PM)

s = surface material silt content (%) = 10

W = mean vehicle weight (tons) = 39 tons

M = surface material moisture content (%) = 0.2

VMT = (1,000,000 tons/yr / 36 tons/truckload) x (0.45 miles/truckload)

= 12,500 miles/yr

control efficiency = 70%, assuming watertruck for unpaved roads

⁴ Fugitive emissions

3. Total Emissions for Facility

Pollutant	810 hp Diesel Engine Generator (tpy)	Stone Processing Operations (tpy)	Total (tpy)
NO _x	18.19	-----	18.19
CO	4.83	-----	4.83
SO ₂	2.90	-----	2.90
PM	0.40	41.17	41.57
PM ₁₀	0.33	13.75	14.08
PM _{2.5}	0.27	1.9	2.17
VOC	0.51	-----	0.51
HAPS	2.44 E-02		2.44 E-02

4. Greenhouse Gas (GHG) Emissions:

Mass Greenhouse Gas (GHG) Emissions

Unit No.	Fuel Type	Annual Operating Hours	Heat Input Capacity (MMBtu/hr)	CO ₂ Emission Factor ¹ (lb/MMBtu)	CO ₂ Annual Emissions (ton/yr)	N ₂ O Emission Factor ¹ (lb/MMBtu)	N ₂ O Annual Emissions (tons/yr)	CH ₄ Emission Factor ¹ (lb/MMBtu)	CH ₄ Annual Emissions (tons/yr)
DEG	No. 2 Fuel Oil	2,080	5.47	163.1	927.84	1.32E-03	7.51E-03	6.62E-03	3.77E-02
Total Annual Greenhouse Gas Emissions					927.84		7.51E-03		3.77E-02

¹ 40 CFR Part 98 Subpart C, Table C-1 and Table C-2

CO₂ Equivalent (CO₂e) Emissions

CO ₂ e (tpy) ¹			
Unit No.	CO ₂	N ₂ O	CH ₄
DEG	927.84	2.33	0.79
Total Annual CO₂e(tpy) = 930.96			

¹ CO₂e calculated using global warming potential (GWP) from 40 CFR Part 98 Subpart A, Table A-1. GWP: CO₂ = 1, N₂O = 310, CH₄ = 21

Air Quality Assessment:

Since there were no modifications proposed in this permit renewal application, an Ambient Air Quality Impact Assessment (AAQIA) was not required to be performed for the facility.

Significant Permit Conditions:

For the renewal of this temporary covered source permit, the following significant permit conditions from 40 CFR Part 63, Subpart ZZZZ (RICE NESHAP) were incorporated:

Attachment II, Special Condition No. C.16

16. On and after May 3, 2013, the permittee shall comply with the following requirements for the diesel engine generator:
 - a. An oxidation catalyst system shall be installed, operated, and maintained;
 - b. Except during startup, limit the concentration of carbon monoxide (CO) in the engine exhaust to 23 ppmvd at fifteen (15) percent O₂; or reduce CO emissions by seventy (70) percent or more;
 - c. Except during startup, the engine exhaust temperature shall be maintained such that the temperature at the oxidation catalyst inlet is greater than or equal to 450 °F and less than or equal to 1350 °F;
 - d. The oxidation catalyst shall be maintained such that the pressure drop does not change by more than 2" H₂O at 100% load (± 10%) from the pressure drop across the catalyst measured during the initial performance test, excluding periods of startup;
 - e. The engine idling during startup shall be minimized and startup shall not exceed thirty (30) minutes;
 - f. A closed crankcase ventilation system or a filtration system on the open crankcase ventilation system shall be installed, operated, and maintained; and

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- g. Shall be fired only on diesel fuel no. 2 with a maximum sulfur content not to exceed 0.0015% by weight and a minimum cetane index of forty (40) or a maximum aromatic content of thirty-five (35) volume percent.

Attachment II, Special Condition Nos. D.7 and D.8

7. Not later than May 3, 2013, the permittee shall install, operate, and maintain a continuous parameter monitoring system (CPMS) to monitor and record temperature at the oxidation catalyst inlet on the diesel engine generator. The permittee must prepare a site-specific monitoring plan. The CPMS and the site-specific monitoring plan must meet the requirements of 40 CFR §63.6625(b).
8. Once the testing required pursuant to Special Condition No. F.9 of this Attachment is completed, the permittee shall measure and record the pressure drop across each oxidation catalyst on a monthly basis except during months in which the diesel engine generator does not operate.

Attachment II, Special Condition Nos. E.6 and E.7

6. The permittee shall notify the Department of Health and U.S. EPA, Region 9, of the intent to conduct compliance tests as required by Special Condition No. F.9 of this Attachment at least **sixty (60) days** prior to the scheduled test date.
7. The permittee shall notify the Department of Health and U.S. EPA, Region 9, of the compliance status of the diesel engine generator relative to the requirements of Attachment II, Special Condition No. C.16.b within **sixty (60) days** of completion of the testing program required by Special Condition No. F.9 of this Attachment.

Attachment II, Special Condition No. F.9

9. The permittee shall conduct initial performance tests on the diesel engine generator to demonstrate compliance with the requirements of Special Condition No. C.16.b of this Attachment, no later than October 30, 2013. Performance tests shall be conducted for carbon monoxide (CO). The catalyst pressure drop and catalyst inlet temperature shall also be measured and recorded. Subsequent performance tests shall be conducted after every 8,760 hours of operation or three (3) years of operation, whichever comes first. Performance tests shall be conducted under such conditions as the EPA specifies to the permittee based on representative performance (i.e., performance based on normal operating conditions) of the diesel engine generator. Performance tests for emissions of CO shall be conducted and results recorded and reported in accordance with the test methods and procedures set forth in 40 CFR §63.6620.
 - a. At least **sixty (60) days** prior to performing a performance test, the permittee shall submit a written *performance test plan* to the Department of Health that describes the test duration, test locations, test methods, source operation and other parameters that may affect test results. Such a plan shall conform to

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- U.S. EPA guidelines including quality assurance procedures. A test plan or quality assurance plan that does not have the approval of the Department of Health may be grounds to invalidate any test and require a retest.
- b. Within **sixty (60) days** after completion of the performance test required by Special Condition No. F.9 of this Attachment, the permittee shall submit to the Department of Health and U.S. EPA, Region 9, (Attention: AIR-3), the test report which shall include the operating conditions of the diesel engine generator at the time of the test, the analysis of the fuel oil, the summarized test results, comparative results with the permit emission limits, and other pertinent field and laboratory data.
 - c. The permittee may conduct the performance tests on a non-operational diesel engine generator when the engine is started up again. The performance tests shall be conducted within **one hundred eighty (180) days** after startup of a non-operational engine.
 - d. The permittee, at its own expense, shall be responsible for installing and providing the necessary ports in stacks or ducts and such other safe and proper sampling and testing facilities as may be necessary for the determination of the air pollutants emissions. The Department of Health may monitor the tests.
 - e. The performance test shall consist of three (3) separate runs using the applicable test method. For the purpose of determining compliance with an applicable regulation, the arithmetic mean of the results from the three (3) runs shall apply.
 - f. Any deviations from these conditions, test methods, or procedures may be cause for rejection of the test results unless such deviations are approved by the Department of Health before the tests.

Conclusion and Recommendations:

Recommend issuing the renewal for Temporary Covered Source Permit, CSP No. 0467-01-CT, subject to the significant permit conditions shown above. The existing permit conditions and project emissions remain basically unchanged, as the facility operations have not changed. A thirty-day (30-day) public comment period and forty five-day (45-day) EPA review period are also required.

Reviewer: Darin Lum
Date: 5/2013