

PROPOSED

PERMIT APPLICATION REVIEW COVERED/TEMPORARY COVERED SOURCE PERMIT NO. 0332-01-C/CT Application for Renewal and Significant Modification No. 0332-08

Company: O. Thronas Inc., dba Kauai Aggregates

Mailing Address: P.O. Box 269
Lawai, Hawaii 96765

Facility: 700 TPH Stone Quarrying and Processing Plant

Location: 1. Halewili Road, Eleele, Kauai
UTM: Zone 4, 440,500 m E, 2,422,250 m N (NAD 83)
2. Various Temporary Sites, State of Hawaii (Various Equipment)

SIC Code: 1442 (Construction Sand and Gravel)

Responsible Official: Mr. R. Scott Pingrey
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Equipment:

Stone Quarrying and Processing Plant with:

1. 700 TPH Nordberg jaw crusher, model no. LT110, serial no. 72940 (manufactured in 2005), with 425 bhp Caterpillar diesel engine, model no. C-12 DITA, serial no. BDL04410;
2. 450 TPH Nordberg cone crusher, model no. 1144, serial no. 1144-121 (manufactured in 1987);
3. 485 TPH Nordberg cone crusher, model no. HP300, serial no. 186 (manufactured in 1993);
4. 300 TPH Canica impact crusher, model no. 100 VSI, serial no. 100102-89 (manufactured in 1989);
5. 2-deck El-Jay screen, model no. FS 5162-24, serial no. 1051 (manufactured in 1972);
6. 264 TPH 2-deck El-Jay screen, 4'x12', serial no. 1426;
7. 440 TPH 3-deck JCI screen, model no. 620332, serial no. 97HO1F32 (manufactured in 1997);
8. 440 TPH 3-deck JCI screen, model no. 620332, serial no. 96HO1F32;
9. 3-deck El-Jay screen, 6'x20', model no. FSG620332, serial no. 3410490 (manufactured in 1990);
10. 500 TPH 2-deck Hewitt Robins screen, model no. M-16MDC, serial no. VS-232 (manufactured in 1970's);
11. 480 bhp (300 kW) Caterpillar diesel engine generator, model no. C9DITA, serial no. OC9E01760;

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12. 1,576 bhp Caterpillar diesel engine generator, model no. 3512 DI TA JWAC, serial no. 24Z01250;
13. Powerscreen radial stacker, model no. M95, serial no. 7436135;
14. Telestack radial stacker, model no. TC421;
15. Various conveyors;
16. Water spray systems; and
17. Water trucks.

BACKGROUND

Kauai Aggregates has submitted an application for renewal and significant modification to its covered source permit. Kauai Aggregates is proposing to add the following pieces of equipment to its permit:

1. 440 TPH 3-deck JCI screen, model no. 620332, serial no. 97HO1F32 (manufactured in 1997);
2. 500 TPH 2-deck Hewitt Robins screen, model no. M-16MDC, serial no. VS-232 (manufactured in 1970's);
3. 480 bhp (300 kW) Caterpillar diesel engine generator, model no. C9DITA, serial no. OC9E01760;
4. 450 TPH Nordberg cone crusher, model no. 1144, serial no. 1144-121 (manufactured in 1987);
5. Powerscreen radial stacker, model no. M95, serial no. 7436135;
6. 264 TPH 2-deck El-Jay screen, 4'x12', serial no. 1426; and
7. Telestack radial stacker, model no. TC421.

The following existing pieces of equipment will be removed from the permit:

1. 320 TPH Hewitt-Robins hopper, model no. unknown, serial no. FEG 04339-04;
2. 320 TPH Austin Westin jaw crusher, model no. 3240, serial no. 10170 (manufactured in 1979);
3. 3-deck Hewitt-Robins screen, 6'x20', serial no. C 70578301 (manufactured in 1989); and
4. 500 TPH Nordberg cone crusher, model no. 1560, serial no. 304-300034.

The proposed 440 TPH JCI screen (serial no. 97HO1F32), 264 TPH El-Jay screen, and Powerscreen radial stacker were previously permitted under Temporary Covered Source permit no. 0242-01-CT. The proposed Hewitt Robins screen will be powered by the 480 hp Caterpillar diesel engine generator. The 480 hp diesel engine generator will be fired on fuel oil no. 2 with a maximum sulfur content of 0.0015% by weight.

The total operating hours of the stone quarrying and processing plant, diesel engine, and diesel engine generators will be limited to 3,000 hours in any rolling 12-month period. Water sprays and a water truck will be used to control fugitive emissions.

Kauai Aggregates has requested for the option of operating the portable equipment at different locations from the main stationary site. The permit will be issued as a covered/temporary covered source (C/CT).

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

11-60.1-31, Applicability

11-60.1-32, Visible Emissions

11-60.1-33, Fugitive Dust

11-60.1-38, Sulfur Oxides from Fuel Combustion

Subchapter 5, Covered Sources

Subchapter 6, Fees for Covered Sources, Noncovered Sources, and Agricultural Burning

11-60.1-111, Definitions

11-60.1-112, General Fee Provisions for Covered sources

11-60.1-113, Application Fees for Covered sources

11-60.1-114, Annual Fees for Covered sources

11-60.1-115, Basis of Annual Fees for Covered Sources

Subchapter 8, Standards of Performance for Stationary Sources

11-60.1-161, New Source Performance Standards

Subchapter 10, Field Citations

Standard of Performance for New Stationary Sources (NSPS), 40 CFR Part 60

Subpart OOO – Standards of Performance for Nonmetallic Mineral Processing Plants is applicable to the crushers, screens, and conveyors, excluding the 2-deck El-Jay screen (serial no. 1051) and 500 TPH Hewitt Robins screen, because the maximum capacity of the facility is greater than 150 tons/hour, and the plants were manufactured after August 31, 1983. The 2-deck El-Jay screen (serial no. 1051) and 500 TPH Hewitt Robins screen were manufactured before August 31, 1983.

Subpart IIII – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines is not applicable to the diesel engine and diesel engine generators because the engines are considered nonroad engines as defined in 40 CFR §1068.30. Subpart IIII applies to stationary internal combustion engines that are not nonroad engines. The diesel engine and diesel engine generators will be moved within the quarry and will not remain at a location or single site for more than twelve (12) consecutive months.

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

This source is not subject to NESHAPs because there are no standards in 40 CFR Part 61 applicable to this facility.

NESHAPs for Source Categories (Maximum Achievable Control Technology (MACT)), 40 CFR Part 63

Subpart ZZZZ – National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (RICE) is not applicable to the diesel engine and diesel engine generators because the engines are considered nonroad engines as defined in 40 CFR §1068.30. Subpart ZZZZ applies to stationary internal combustion engines that are not nonroad engines. The diesel engine and diesel engine generators will be moved within the quarry and will not remain at a location or single site for more than twelve (12) consecutive months.

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Prevention of Significant Deterioration (PSD), 40 CFR Part 52, §52.21

This source is not subject to PSD requirements because it is not a major stationary source as defined in 40 CFR §52.21 and HAR Title 11, Chapter 60.1, Subchapter 7.

Compliance Assurance Monitoring (CAM), 40 CFR 64

This source is not subject to CAM because the facility is not a major source. The purpose of CAM is to provide a reasonable assurance that compliance is being achieved with large emissions units that rely on air pollution control device equipment to meet an emissions limit or standard. Pursuant to 40 Code of Federal Regulations, Part 64, for CAM to be applicable, the emissions unit must: (1) be located at a major source; (2) be subject to an emissions limit or standard; (3) use a control device to achieve compliance; (4) have potential pre-control emissions that are 100% of the major source level; and (5) not otherwise be exempt from CAM.

Air Emissions Reporting Requirements (AERR), 40 CFR Part 51, Subpart A

AERR is not applicable because potential emissions from the facility do not exceed AERR thresholds.

DOH In-house Annual Emissions Reporting

The Clean Air Branch requests annual emissions reporting from those facilities that have facility wide emissions exceeding in-house reporting levels and for all covered sources. Annual emissions reporting will be required because this facility is a covered source.

Best Available Control Technology (BACT)

This source is not subject to BACT analysis because potential emissions due to the modification are below significant levels. 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 considering any limitations as defined in HAR, §11-60.1-1.

BACT		
Pollutant	Potential Emissions (TPY)	Significant Levels (TPY)
CO	0.4	100
NO _x	6.5	40
SO ₂	0.0	40
PM	8.5	25
PM-10	3.0	15
VOC	0.1	40

Synthetic Minor Source

A synthetic minor source is a facility that is potentially major, as defined in HAR, §11-60.1-1, but is made non-major through federally enforceable permit conditions. This facility is a synthetic minor source because potential NO_x and PM emissions exceed major source thresholds when the facility is operated without limitations for 8,760 hours/year.

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Greenhouse Gas Tailoring Rule

Title V permitting for greenhouse gas (GHG) emissions is not applicable because the potential to emit of CO₂ equivalent (CO₂e) emissions are less than 100,000 tons per year. Total GHG emissions on a CO₂e basis using the global warming potential (GWP) of the GHG are shown in the table below.

GHG	GWP	GHG Mass-Based Emissions (TPY)	CO ₂ e Based Emissions (TPY)
Carbon Dioxide (CO ₂)	1	4204	4204
Methane (CH ₄)	21	0	0
Nitrous Oxide (N ₂ O)	310	0	0
Total Emissions:			4204

INSIGNIFICANT ACTIVITIES / EXEMPTIONS

Diesel Engines

The following diesel engines are considered insignificant activities in accordance with HAR §11-60.1-82(f)(2) because their heat input capacities are less than one MMBtu/hr:

1. 78 hp Deutz (Powerscreen radial stacker): 78 hp x 7,000 Btu/hp-hr = 0.55 MMBtu/hr.
2. 38 hp Deutz (Telestack radial stacker): 38 hp x 7,000 Btu/hp-hr = 0.27 MMBtu/hr.

Storage Tanks

The 7,500 gallon fuel oil no. 2 storage tank is less than 40,000 gallons and is considered an insignificant activity in accordance with HAR §11-60.1-82(f)(1).

ALTERNATIVE OPERATING SCENARIOS

Diesel Engines and Diesel Engine Generators

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

AIR POLLUTION CONTROLS

The stone quarrying and processing plant is equipped with water spray systems to control fugitive dust. Water trucks/water sprays will be used as necessary to minimize fugitive dust from plant operations, material transfer points, stockpiles, and plant roads.

PROJECT EMISSIONS

The operating hours of the stone quarrying and processing plant, diesel engine, and diesel engine generators will be limited to 3,000 hours in any rolling twelve-month (12-month) period.

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Stone Quarrying and Processing Plant

The maximum capacity of the 700 TPH primary jaw crusher was used to calculate emissions. It was assumed all secondary crushers and screens processed 700 TPH of material, although their maximum capacities are less than 700 TPH. Water sprays will be used to control PM emissions. Emissions were based on emission factors from AP-42 Section 11.19.2 (8/04) – Crushed Stone Processing and Pulverized Mineral Processing.

Storage pile emissions were based on emission factors from AP-42 Section 13.2.4 (11/06) – Aggregate Handling and Storage Piles. Vehicle travel on unpaved roads emissions were based on emission factors from AP-42 Section 13.2.2 (11/06) – Unpaved Roads. A 70% control efficiency was assumed for water suppression to control fugitive dust.

Stone Quarrying and Processing Plant						
Pollutant	Stone Quarrying Plant Emissions (TPY)		Storage Pile Emissions (TPY)		Unpaved Road Emissions (TPY)	
	3,000 hr/yr	8,760 hr/yr	3,000 hr/yr	8,760 hr/yr	3,000 hr/yr	8,760 hr/yr
PM	22.7	66.2	8.9	26.1	14.2	41.6
PM-10	8.2	24.0	4.2	12.3	3.5	10.2
PM-2.5	1.1	3.2	0.6	1.9	0.4	1.0

1,576 hp Caterpillar Diesel Engine Generator

The diesel engine generator is fired on fuel oil no. 2 with a maximum sulfur content of 0.5% by weight. Emissions were based on emission factors from AP-42 Section 3.4 (10/96) – Large Stationary Diesel and All Stationary Dual-fuel Engines.

1,576 hp Caterpillar Diesel Engine Generator			
Pollutant	Emissions (lb/hr)	Emissions (TPY) [3,000 hr/yr]	Emissions (TPY) [8,760 hr/yr]
CO	9.45	14.17	41.38
NO _x	35.57	53.36	155.80
SO ₂	5.61	8.42	24.59
PM	1.11	1.67	4.87
PM-10	1.07	1.60	4.67
PM-2.5	1.00	1.50	4.38
VOC	1.00	1.50	4.38
HAPs	0.017	0.026	0.077

425 hp Caterpillar Diesel Engine

The diesel engine is fired on fuel oil no. 2 with a maximum sulfur content of 0.5% by weight. CO, NO_x, PM, and VOC emissions were based on manufacturer's data. The mass balance method was used to determine SO₂ emissions. HAP emissions were based on emission factors from AP-42 Section 3.3 (10/96) – Gasoline and Diesel Industrial Engines.

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425 hp Caterpillar Diesel Engine			
Pollutant	Emissions (lb/hr)	Emissions (TPY) [3,000 hr/yr]	Emissions (TPY) [8,760 hr/yr]
CO	1.21	1.82	5.30
NO _x	5.01	7.52	21.94
SO ₂	1.45	2.18	6.37
PM	0.11	0.17	0.48
PM-10	0.11	0.17	0.48
PM-2.5	0.11	0.17	0.48
VOC	0.14	0.21	0.61
HAPs	0.011	0.017	0.049

480 hp Caterpillar Diesel Engine Generator

The diesel engine generator is fired on fuel oil no. 2 with a maximum sulfur content of 0.0015% by weight. CO, NO_x, PM, and VOC emissions were based on manufacturer's data. The mass balance method was used to determine SO₂ emissions. HAP emissions were based on emission factors from AP-42 Section 3.3 (10/96) – Gasoline and Diesel Industrial Engines.

480 hp Caterpillar Diesel Engine Generator			
Pollutant	Emissions (lb/hr)	Emissions (TPY) [3,000 hr/yr]	Emissions (TPY) [8,760 hr/yr]
CO	0.29	0.44	1.27
NO _x	4.35	6.53	19.05
SO ₂	0.00	0.01	0.02
PM	0.03	0.05	0.13
PM-10	0.03	0.05	0.13
PM-2.5	0.03	0.05	0.13
VOC	0.07	0.11	0.31
HAPs	0.012	0.019	0.054

Total Emissions

Total facility emissions are summarized in the table below.

Total Facility Emissions and Trigger Levels (TPY)					
Pollutant	Emissions (With Limits)	Emissions (No Limits)	BACT Significant Levels	AERR Thresholds	DOH Levels
CO	16.4	48.0	100	1000	250
NO _x	67.4	196.8	40	100	25
SO ₂	10.6	31.0	40	100	25
PM	47.7	139.3	25	-	25
PM-10	17.7	51.8	15	100	25
PM-2.5	3.8	11.1	-	100	-
VOC	1.8	5.3	40	100	25
HAPs	0.06	0.18	-	-	5

AIR QUALITY ASSESSMENT

An ambient air quality impact analysis (AAQIA) was conducted for the proposed 480 hp Caterpillar diesel engine generator to demonstrate compliance with State and National ambient air quality standards. The AERMOD modeling system using Lakes Environmental AERMOD View, Version 8.2.0, was used for the modeling analysis.

Terrain

Terrain data from the USGS National Elevation Dataset with resolution of 1/3 arc-second (about ten (10) meters).

Meteorological data

Meteorological data from Lihue Airport (2005 – 2009) was used for the analysis.

Receptor Grid

Receptor grid spacing was set at thirty (30) meters.

Dispersion Coefficient

Rural dispersion coefficient was selected.

Building Downwash

EPA's Building Profile Input Program (BPIP-PRIME) was used to evaluate downwash effects of nearby structures.

Ozone Limiting Method

The ozone limiting method was used for the one-hour (1-hr) and annual NO_x to NO₂ conversion. An in-stack NO₂/NO_x ratio of 20% for the diesel engine generator was used for the model. The hourly ozone background concentrations were obtained from the Sand Island, Oahu, air monitoring station for the years 2005 through 2009.

Emission Rates and Stack Parameters

The short term emission rates and stack parameters used in the analysis are shown in the table below.

Source	Emission Rates (g/s)					Stack Parameters			
	CO	NO _x	PM-10	PM-2.5	SO ₂	Height (m)	Diameter (m)	Flow Rate (m ³ /s)	Temp (°K)
480 hp DEG	0.0365	0.5481	0.0038	0.0038	0.0006	2.0	0.178	1.16	773

Results

The table below shows the predicted ambient air quality impacts from the diesel engine generator should comply with State and National ambient air quality standards. Although there is an hourly limit for the diesel engine generator, the annual averaging periods assumed no annual limits.

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Predicted Ambient Air Quality Impacts							
Air Pollutant	Averaging Period	Modeled Impact ($\mu\text{g}/\text{m}^3$)	Background ¹ ($\mu\text{g}/\text{m}^3$)	Total Impact ($\mu\text{g}/\text{m}^3$)	SAAQS ($\mu\text{g}/\text{m}^3$)	NAAQS ($\mu\text{g}/\text{m}^3$)	Compared to SAAQS / NAAQS
CO	1-hr	63.4	1718	1781.4	10000	40000	17.8%
	8-hr	59.2	1217	1276.2	5000	10000	25.5%
NO ₂	1-hr	141.4	40.7	182.1	-	188	96.9%
	Annual	31.5	5	36.5	70	100	52.1%
PM-10	24-hr	4.3	40	44.3	150	150	29.5%
	Annual	0.5	16	16.5	50	-	32.9%
PM-2.5	24-hr	2.0	13.1	15.1	-	35	43.3%
	Annual	0.5	5.6	6.1	-	12	50.6%
SO ₂	1-hr	0.7	30	30.7	-	196	15.7%
	3-hr	1.0	18	19.0	1300	1300	1.5%
	24-hr	0.7	10	10.7	365	365	2.9%
	Annual	0.1	4	4.1	80	80	5.1%

1. Background concentrations were taken from the 2012 Hawaii Air Quality Data from Kapolei. NO₂ (1-hr) and PM-2.5 (24-hr) are the 98th percentile concentrations averaged over 3 years. PM-2.5 (annual) is the annual mean concentrations averaged over 3 years.

SIGNIFICANT PERMIT CONDITIONS

1. Operating Hour Limits

- a. The total operating hours of the stone quarrying and processing plant, as represented by the total operating hours of the 1,576 bhp diesel engine generator, shall not exceed 3,000 hours in any rolling twelve-month (12-month) period.
- b. The total operating hours of the 700 TPH crusher, as represented by the total operating hours of the 425 hp diesel engine, shall not exceed 3,000 hours in any rolling twelve-month (12-month) period.
- c. The total operating hours of the 480 hp diesel engine generator shall not exceed 3,000 hours in any rolling twelve-month (12-month) period.

Reason: Operating hour limit proposed by the applicant to limit NO_x and PM emissions below the major source thresholds.

2. Fuel Limits

- a. The 1,576 hp diesel engine generator and 425 hp diesel engine and shall be fired only on fuel oil no. 2 with a maximum sulfur content not to exceed 0.5% by weight.
- b. The 480 hp diesel engine generator shall be fired only on fuel oil no. 2 with a maximum sulfur content not to exceed 0.0015% by weight.

Reason: Fuel types proposed by the applicant.

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3. Diesel Engine and Diesel Engine Generators

The diesel engine and diesel engine generators shall not remain at a location for more than twelve (12) consecutive months or a shorter period of time for an engine located at a seasonal source. A location is any single site at a building, structure, facility, or installation. Any engine (or engines) that replaces an engine at a location and that is intended to perform the same or similar function as the engine replaced will be included in calculating the consecutive time period. An engine located at a seasonal source is an engine that remains at a seasonal source during the full annual operating period of the seasonal source. A seasonal source is a stationary source that remains in a single location on a permanent basis (i.e., at least two (2) years) and that operates at that single location approximately three (3) months (or more) each year.

Reason: To ensure the diesel engine and diesel engine generators operate as non-road engines. 40 CFR Part 60, Subpart IIII, and 40 CFR Part 63, Subpart ZZZZ, are not applicable to non-road engines.

4. Fugitive Emission Limits

- a. The permittee shall not cause to be discharged into the atmosphere from any crusher, fugitive emissions which exhibit greater than fifteen (15) percent opacity.
- b. The permittee shall not cause to be discharged into the atmosphere from any transfer point on the belt conveyors, screening operation, or from any other affected facility, excluding the 2-deck El-Jay screen (serial no. 1051) and 500 TPH Hewitt Robins screen, fugitive emissions which exhibit greater than ten (10) percent opacity.

Reason: 40 CFR 60, Subpart OOO, provisions. The 2-deck El-Jay screen (serial no. 1051) and 500 TPH Hewitt Robins screen are not subject to Subpart OOO because they were manufactured before the applicable date.

CONCLUSION

Kauai Aggregates has submitted an application for renewal and modification to its covered source permit. Water sprays will be used to control fugitive emissions. Potential emissions were based on the maximum rated capacities of the equipment. The ambient air quality impact analysis of the proposed 480 hp diesel engine generator demonstrates compliance with State and National Ambient Air Quality Standards. Recommend issuance of the covered source permit subject to the incorporation of the significant permit conditions, thirty-day (30-day) public comment period, and forty five-day (45-day) Environmental Protection Agency review period.

Mark Saewong
July 18, 2013