

Covered Source Permit Review No. 0332-01-C
Application for Renewal No. 0332-02
320 TPH Stone Quarrying and Processing Plant

Applicant: Kauai Aggregates (aka O. Thronas Inc.)

Equipment Description:

This 320 tph Fixed (by definition of 40 CFR 60.671) Stone Quarrying and Processing Plant includes the following equipment:

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, manuf. date 1979);
3. 2-deck El-Jay screen (model no. FS 5162-24, serial no. 1051, manuf. date 1972);
4. 3-deck Hewitt-Robins screen (6'x16', serial no. GT 7183, manuf. date 1957);
5. 200 tph El-Jay cone crusher (model no. 54, serial no. 476, manuf. date 1972);
6. 3-deck Hewitt-Robins screen (6'x20', serial no. C 70578301, manuf. date 1989);
7. 300 tph Canica impact crusher (model no. 100 VSI, serial no. 100102-89, manuf. date 1989);
8. Pioneer rolls crusher (model no. 4022, serial no. 42 VAE 96, manuf. date 1951, production rate is unknown);
9. nineteen (19) conveyors;
10. 750 kW Caterpillar diesel engine generator (model no. Denver 349, serial no. 61P482, max. 56 gal/hr fuel oil no. 2);
11. Water sprays; and
12. Water trucks

Equipment Location:

Kauai Aggregates
Halewili Road, Eleele, Kauai 96705 (no street address)
UTM Coordinates: NAD-83 Zone 4, 2,422,250m N; 440,500m E

Responsible Official:

Puanani Blake
Comptroller
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Point of Contact:

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Proposed Project:

There is no proposed change to the equipment or operation of the facility. Although Appendix A of the application mentions that there were two additional conveyors, the plant layout and Section F of the application confirms that there is no proposed modification. The new CSP will reflect some changes due to new information for the equipment. Based on the Canica crusher specification sheet, the maximum production rate will be changed from 100 to 300 tph. There will be no change in emissions because this crusher is smaller than the primary crusher. Also, the crushers and screens that were built prior to August 31, 1983 without reconstruction or modification will be removed from NSPS Subpart OOO requirements.

This facility was constructed in 1982 by Grace Brothers Ltd. and was transferred to Kauai Aggregates in 1986.

This stone quarrying and processing plant is located in a remote location abutting Kauai Coffee Company's coffee fields. The plant is bordered by the quarry on all directions except for the concrete barricaded ravine on the west.

The general description (SICC 1442) is to process stone material via front-end loaders, conveyors, crushers, and screens. The amount of crushing and handling depends on the type of material desired. For example, the fine aggregate will require more crushing and handling (and therefore create more fugitive emissions) than larger aggregate. Fugitive emissions are suppressed by using water sprays and enclosures at the aggregate transfer points and water trucks throughout the quarry. The typical hours of operations are 8 hours/day, 5 days/week, and 52 weeks/year. This facility is a covered source because it is subject to federal standards (NSPS Subpart OOO).

This permit review is based on the application dated July 15, 2002 and revision dated April 8, 2004 and telephone conversation on March 2, 2004, between Ms. Puanani Blake and Mr. Corey Shibata. The application fee of \$500 for a renewal of a non-major CSP has been processed and the receipt will be issued with the permit. CSP No. 0332-01-C dated September 18, 1998 will be superseded upon issuance of the new permit.

Air Pollution Controls:

Water sprays and water trucks are used to control fugitive particulate matter (PM) emissions at strategic locations. Usually a 70% efficiency factor is used for these types of air pollutant controls. Some enclosures may be used at transfer points and stockpiles, but the applicant did not identify specific locations and did not apply efficiency factors (for the use of enclosures).

Applicable Requirements:

40 CFR Part 60 - New Source Performance Standard (NSPS)

Subpart A - General Provisions

Subpart OOO - Standards of Performance for Nonmetallic Mineral Processing Plants since the initial crusher produces over 25 tons/hour (for a fixed crusher) of aggregate and certain equipment were manufactured after August 31, 1983.

Specifically the following equipment are subject to NSPS Subpart OOO:

1. 300 tph Canica impact crusher (model no. 100 VSI, serial no. 100102-89, manuf. date 1989);
2. 3-deck Hewitt-Robins screen (6'x20', serial no. C 70578301, manuf. date 1989); and
3. All conveyors (because reconstruction was assumed)

Hawaii Administrative Rules (HAR) Chapter 11-59

Hawaii Administrative Rules (HAR) Chapter 11-60.1

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

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

Compliance Data System (CDS) since this is a covered source.

Non-Applicable Requirements:

40 CFR Part 61 and 63 - National Emission Standard for Hazardous Air Pollutants (NESHAPS) and Maximum Achievable Control Technology (MACT) since there is no specific source category for stone quarrying and processing and the facility is not a major source of hazardous air pollutants (HAPS) emissions.

Prevention of Significant Deterioration (PSD) and since this is not a major stationary source.

Compliance Assurance Monitoring (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 CFR, 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 precontrol emissions that are greater than the major source level [>100 tpy]; and (5) not otherwise be exempt from CAM. CAM is not applicable to the plant since items 1,3, and 5 do not apply.

Consolidated Emissions Reporting Rule (CERR) since the potential individual criteria pollutant emissions from the facility is less than 100 tpy each when restricted to the operational limits. However, internal annual emissions reporting is required since NO_x and PM facility wide emissions are each greater than 25 tpy and it is a covered source.

A Best Available Control Technology (BACT) analysis is required for new sources or modifications to existing sources that would result in a net significant emissions increase as defined in HAR, Section 11-60.1-1. This is an existing source with no increase in emissions. Therefore, a BACT analysis was not performed.

Insignificant Activities/Exemptions:

Insignificant activities based on size, emission level, or production rate, are as follows (from the CSP application):

<u>Basis for Exemption</u>	<u>Description</u>
HAR §11-60.1-82(f)(1)	One (1) fuel oil no. 2 storage tank with a capacity of 7,500 gallons since its capacity is less than 40,000 gallons and is not subject to Section 111 or 112 of the CAA.
HAR §11-60.1-82(f)(1)	One (1) 92 HP Caterpillar diesel engine, Model D6 that powers the Pioneer Rolls crusher since it is a fuel burning equipment with a heat input of less than 1 MMBtu/hr ($92 \text{ HP/hr} * 2542.5 \text{ MMBtu/HP} / 0.35 \text{ loss of efficiency} = 0.67 \text{ MMBtu/hr}$)

Alternative Operating Scenarios:

Pursuant to a 3/2/04 telephone conversation between Ms. Puanani Blake and Mr. Corey Shibata, the permittee requested to include the use of a temporary DEG and stone processing equipment in the event of equipment failure or overhaul.

Project Emissions:

By permit, the plant is restricted to 3,000 hr/yr. This means that the maximum production rate when operating at 320 tph is limited to 960,000 tpy of processed stone. As mentioned in the **Proposed Project** section, maximum potential air pollutant emissions will remain the same. However, the calculated potential emissions for this review is different from the previous review due to different assumptions/variables and incorrect/updated emission factors. Most of the calculations provided in the application were checked and found to be similar to the previous review. Therefore, the calculations provided by the application were used in this review except for the unpaved roads results (the Department's calculations for unpaved roads were more conservative and there is no change in permit applicability).

In any event, this facility remains a non-major covered source with no change in equipment or operation that would increase potential air pollutant emissions.

The following current AP-42 emission factors were used in this review:

- 3.4 - Large Stationary Diesel and all Stationary Dual-Fuel Engines (10/96)
- 13.2.2 - Unpaved Roads (9/98)
- 13.2.4 - Aggregate Handling and Storage Piles (1/95)
- 11.19.2 - Crushed Stone Processing (1/95)

TABLE 1 - POTENTIAL FACILITY EMISSIONS

	DEG (TPY)	STONE PROCESSING (TPY)	UNPAVED ROADS (TPY)	HANDLING / PILES (TPY)	TOTAL (TPY)
SO₂	5.81				5.81
NO_x	36.83				36.83
CO	9.78				9.78
PM	0.80	15.44	40.75	4.08	61.07
PM₁₀	1.15	7.35	14.67	1.93	25.10
VOC	1.04				1.04
HAPs	0.05				0.05

Note:

1. All emissions were based on 3,000 hr/yr of operation._____

Refer to Appendix B of the application (and permit review dated 5/21/98 for unpaved roads) for calculation details. As shown in **TABLE 1**, this facility is not a major source since each potential air pollutant emission is below 100 tpy. However, this facility is a synthetic minor since it would be a major source of PM if it was to operate continuously (8,760 hr/yr).

Ambient Air Quality Assessment:

A new ambient air quality assessment (AAQA) was conducted by the applicant's consultant using an EPA SCREEN3 model version 96043 to determine source compliance with national and state ambient air quality standards (NAAQS and SAAQS). This new AAQA was optional and not required since there are no proposed changes to the equipment or operations that would change air pollutant emission. The default options, stack parameters, and calculations are similar to the previous AAQA. However, the emission rates in grams/second have been revised to match the updated emissions rates mentioned in the **Project Emissions** section and the fence line has been adjusted. Overall, the model, methodology and assumptions employed in the AAQA have been determined to be consistent with state and federal guidelines and are discussed below.

SCREEN3 was run with the regulatory default option selected. The default options include the use of rural dispersion coefficients, stack tip downwash, default wind speed profile exponents, upper bound concentrations for downwash, and the calm processing routine. The default full meteorology was also selected and 298° K was used as the ambient temperature.

Modeling was performed using radial lines from the DEG stack with discrete distances starting from the fence line. The terrain generally slopes upward towards the north. There is a high quarry wall on the north and east, a ravine on the west, and a downward slope to the south. The previous AAQA assumed that the fence line was at 91m to the west for simple terrain impacts and 884m to the north for complex terrain impacts. This AAQA assumed that the fence line is 274m for both simple and complex terrain impacts. This is reasonable because this location is the closest point at the top of the quarry wall. The previous location of 91 m may be too conservative since the ravine was rather deep and broad. It could be unreasonable to consider the ravine as accessible to the public. The modeled maximum concentration was found to be at 274m (fenceline atop the quarry wall at a height of 26m) for complex terrain.

A Good Engineering Practice (GEP) stack height analysis was performed using the dimensions of all nearby structures and buildings (i.e. height, width, length, and distance to stack). The results of the analysis showed that the physical stack height of diesel engine was less than the GEP formula stack height. Therefore, the dimensions of the structure of greatest impact (the cone crusher - same as the previous AAQA) was used in the model.

TABLE 2 presents the potential to emit/allowable emission rates and stack parameters of the DEG used in the AAQA. The derivation of SO₂, NO_x, CO, and PM₁₀ emission rates were previously discussed in the **Project Emissions** subsection. Lead and hydrogen sulfide emissions are negligible.

The predicted concentrations presented in **TABLE 3** includes permit limitations of 3,000 hr/yr and that 75 percent of emitted NO_x will be converted to NO₂. Based on these assumptions, the facility should comply with NAAQS and SAAQS for SO₂, NO₂, CO, and PM₁₀. The results of this AAQA is very similar to the results of the previous AAQA.

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Reviewed by: CS
May 7, 2004

TABLE 2
SOURCE EMISSION RATES AND STACK PARAMETERS FOR AIR MODELING

SOURCE		EMISSION RATES					STACK PARAMETERS			
Equipment	Stack No.	SO ₂ (g/s)	NO _x (g/s)	CO (g/s)	PM ₁₀ (g/s)	Pb (g/s)	Height (m)	Temp. (K)	Velocity (m/s)	Diameter (m)
DEG	1	0.488	3.094	0.821	0.096	--	4.27	750	44.3	0.29

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TABLE 3
PREDICTED AMBIENT AIR QUALITY IMPACTS

AIR POLLUTANT	AVERAGING TIME	IMPACT ($\mu\text{g}/\text{m}^3$)	BACKGROUND ¹ ($\mu\text{g}/\text{m}^3$)	TOTAL IMPACT ($\mu\text{g}/\text{m}^3$)	AIR STANDARD ($\mu\text{g}/\text{m}^3$)	PERCENT STANDARD	IMPACT LOCATION (R) ²
SO ₂	3-Hour	81.67	--	82	1300	6%	274
	24-Hour	36.29	--	36	365	10%	274
	Annual ³	6.21	--	6	80	8%	274
NO ₂	Annual ^{3,4}	29.53	--	30	70	42%	274
CO	1-Hour	152.74	--	153	10000	2%	274
	8-Hour	106.91	--	107	5000	2%	274
PM ₁₀	24-Hour	7.18	--	7	150	5%	274
	Annual ³	1.23	--	1	50	2%	274
Pb	Calendar Quarter	--	--	--	1.5	--	--
H ₂ S	1-Hour	--	--	--	35	--	--

Note:

1. The background concentrations are not required since this is an existing source with no increase in emissions.
2. (R) is the distance to the receptor which is located at the fenceline atop the quarry wall.
3. The Annual concentrations are based on a limitation of 3,000 hours in any rolling 12-month period.
4. The ARM Method was used to calculate NO₂ concentrations (0.75 x NO_x).

Other Issues:

Kauai Aggregates was issued an informal Notice of Violation (NOV) for the late submittal of reports and compliance certification on 10/11/00. Otherwise there were no significant issues with the equipment or operation.

Significant Existing Permit Conditions:

1. Maximum of 3,000 hours of operation in any rolling 12-month period for the DEG which powers the stone processing plant (in order to meet the SAAQS for NO_x).
2. NSPS 40 CFR 60 Subpart OOO (because of the listed equipments capacities and date of fabrication)
 - a. The permittee shall not cause to be discharged into the atmosphere from any transfer point on the conveyors or from any other affected facility any fugitive emissions which exhibit greater than ten percent (10%) opacity.
 - b. The permittee shall not cause to be discharged into the atmosphere from any affected crusher, fugitive emissions which exhibit greater than fifteen percent (15%) opacity.
 - c. The permittee shall conduct or cause to be conducted annual source performance test to determine the opacity (as stated above) of fugitive emissions from the stone processing plant.
3. Monthly and annual visible emissions (V.E.) observations for the DEG (as required by EPA).

Significant New Permit Conditions:

1. Update standard conditions.
2. Alternate operating scenarios for temporary DEG and stone processing equipment in the event of equipment failure or overhaul (to allow flexibility).
3. Monthly and annual visible emissions (V.E.) observations for the crushers and transfer points (as updated by EPA).

Conclusion and Recommendation:

In conclusion, the facility complies with all State and Federal laws, rules, regulations, and standards with regards to air pollution. Therefore, a Renewal of a CSP for Kauai Aggregates is recommended based on the information provided in the air permit application and subject to the following:

1. Above special permit conditions;
2. 30-day public review period; and
3. 45-day EPA review period.