

PROPOSED

Temporary Covered Source Application Review
Application No. 0626-01

File #: 0626-01

Applicant: Kiewit Pacific Company

Facility Title: 357 TPH Portable Stone Quarrying and Processing Plant
with One (1) 1,100 kW Diesel Engine Generator

Location : Various Temporary Sites, State of Hawaii
Initial Location: Koloa, Kauai
450,980 m E, 2,421,500 m N (NAD-83)

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Equipment Description:

Table 1 - Rock Crushing Operation

Unit	Type	Manufacturer	Model	Year	Description	Capacity	Fuel
Portable Crushing Plant	Primary Jaw Crusher	Pioneer	30" x 42"; Serial # UHC3894	1990	30" x 42" feed opening Crushing of basalt rock, concrete, etc.	357 TPH ^a	driven by Diesel Engine Gen. listed below
	Impact Crusher	Torgensen	500HP w/40HP screen back; Serial # CHX19	1989	secondary crushing	300 TPH	driven by Diesel Engine Gen. listed below
	Vibrating Screen	Eljay	--	--	6' x 20' feed point for crusher	--	driven by Diesel Engine Gen. listed below
	Misc. Conveyors	--	--	--	transports material btw crushers, screen and stockpiles	--	driven by Diesel Engine Gen. listed below
	Water spray system	--	--	--	nozzles located at material transfer points (see below)	--	N/A
	Diesel Engine Generator	Caterpillar	3512; Serial # 24Z02490	1989	Drives crushers, screens, and conveyors	1,100 kW ^a	Diesel # 2 max 74.4 gph ^a

^a Based on manufacturers specifications.

Any changes to the proposed setup, operation, or materials processed in the plant shall warrant a re-evaluation of the maximum capacity.

Air Pollution Controls:

The facility will control particulate emissions by employing water spray bars at the following material transfer points:

1. At Pioneer Jaw Crusher
2. At transfer point from conveyor # 1 to stacker # 1
3. At transfer point from stacker # 1 to stock pile
4. At transfer point from jaw crusher to conveyor # 2
5. At transfer point from conveyor # 3 to conveyor # 4
6. At transfer point from conveyor # 5 to conveyor # 3
7. At transfer point from Impact Crusher to conveyor # 5
8. At Torgeson Impact Crusher

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9. At transfer point from conveyor # 6 to stacker # 2
10. At transfer point from stacker # 2 to stock pile

Stockpiles, crushing area, and unpaved truck access routes are controlled by a water truck.

Air pollution control is also achieved through the use of diesel no. 2 with a maximum sulfur content not to exceed 0.5% by weight.

Proposed Project:

Kiewit Pacific Company proposes to operate a new portable crushing plant at various locations. Kiewit Pacific Company is proposing to crush basalt rock, other types of rocks, concrete, and other materials suitable for crushing and recycling with the mobile crusher. The operation would consist of feeding the crusher by front end loader. The material is deposited on the vibrating grizzly feeder and travels through the jaw crusher. Part of the material travels on conveyor #1 to stacker #1 and is discharged onto stockpile #1. The remaining material is crushed to size and discharged onto conveyor #2, transferred to conveyors #3 and #4, and then to the Eljay Vibrating Screen and Torgeson Impact Secondary Crusher. Oversize material is returned to conveyor #3 by conveyor #5 to be crushed again. Proper size material travels on conveyor #6 to stacker #2 and is delivered to stockpile #2.

The 1,100 kW Caterpillar 3512 diesel engine generator provides the power for the crushers, screen, and conveyors.

The length of operation at each project site would vary between a few weeks to several months with normal operating hours of 8 hours per day, 5 days per week. Operations will be irregular depending on job availability. Typically, there are times when the plant will sit idle.

The applicant proposes that operating hours of the portable stone processing plant and diesel engine generator be limited to not more than 2,080 hours/yr.

The diesel engine generator will be run on diesel no. 2, with sulfur content not to exceed 0.5% by weight. Kiewit Pacific Co. will utilize a 1,000 gallon fuel tank for the storage of diesel fuel.

The application fee for an initial temporary covered source permit of \$1,000.00 was processed.

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

Subchapter 8 - Standards of Performance for Stationary Sources

11-60.1-161(25) Standards of Performance for Non-metallic
Mineral Processing Plants

Subchapter 10 - Field Citations

New Source Performance Standards:

40 Code of Federal Regulations (CFR) Part 60 - Standards of Performance for New
Stationary Sources

Subpart A - General Provisions

Subpart 000 - Standards of Performance for Non-metallic Mineral
Processing Plants

40 CFR Part 60 Subpart 000 applies to portable crushed stone plants with capacities greater than 150 TPH that commence construction, reconstruction, or modification after August 31, 1983. The subject 357 TPH portable crushing plant was manufactured after this date, and thus the crushing plant, including the conveying systems are subject to Subpart 000. The dates of manufacture for the equipment are shown in Table 1. Equipment for which dates were not provided were assumed to be after August 31, 1983 (worst case).

This source is not subject to PSD requirements because it is not a major stationary source, as defined in HAR Title 11, Chapter 60.1, Subchapter 7 and 40 CFR Part 52, Section 52.21.

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This source is not subject to NESHAPS as there are no standards in 40 CFR Part 61 applicable to this facility (stone processing plant operations).

This source is not subject to MACT as the facility is not a major source of HAPS, covered under 40 CFR Part 63.

A Best Available Control Technology (BACT) analysis is required for new sources or modifications to existing sources that would result in a net significant emission increase as defined in HAR, §11.60.1-1. This facility is considered a new source and the facility emissions operating at 2,080 hrs/yr does not exceed the significant level for any pollutant. Thus, a BACT analysis is not required. See Table 2 for details.

The definition of major (HAR §11-60.1-1) includes the consideration of fugitives in calculating potential emissions for major source determination and thus were considered in determining BACT applicability (i.e., vehicle traffic, stockpiles, etc.).

Table 2 - Comparison of Significant Levels to Net Emissions

Pollutant	Potential Emissions* (TPY)	Significant Levels (TPY)
PM	13.99	25
PM ₁₀	5.20	15
SO ₂	5.45	40
NO _x	34.05	40
CO	9.01	100
VOC	0.95	40

*Includes emissions from crushed stone processing, aggregate handling and storage piles, vehicle traffic on unpaved roads, and the 1,100 kW diesel engine generator. Facility emissions were based on the maximum operation of the crushing plant and diesel engine generator for 2,080 hours/year with the use of water sprays.

Compliance Assurance Monitoring (CAM) Applicability:

CAM is not applicable to this facility since the facility is not a major source of pollutants.

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 Table 3. This facility does not emit at the CER triggering levels. Therefore, CER requirements are not applicable.

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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 pollutant exceeding in-house triggering levels. Since the total emissions of NO_x from the diesel engine generator is greater than 25 tons per year, annual emissions reporting for the facility will be required for in-house recordkeeping purposes.

Insignificant Activities:

Diesel no. 2 fuel will be stored on site in a 1,000 gallon fuel storage tank. This storage tank is exempt from the air permit requirements per HAR, §11-60.1-82(f)(1) because it has a capacity of less than 40,000 gallons and is not subject to any standard or other requirement pursuant to Section 111 or 112 of the CAA. This tank is not subject to NESHAPS as there are no standards in 40 CFR Part 61 applicable to this source. It is also not subject to NSPS as there are no applicable regulations in 40 CFR Part 60 pertaining to this fuel tank.

- Subpart K (Standards of Performance for Storage Vessels for Petroleum Liquids for Which Construction, Reconstruction, or Modification Commenced After June 11, 1973, and Prior to May 19, 1978) and Subpart Ka (Standards of Performance for Storage Vessels for Petroleum Liquids for Which Construction, Reconstruction, or Modification Commenced After May 18, 1978, and Prior to July 23, 1984) are not applicable because the diesel fuel no. 2 stored in the tanks is not classified as a petroleum liquid. Per the definitions of these sections, petroleum liquids do not include diesel fuel oils Nos. 2-D through 4-D as specified in ASTM D975-78.
- Subpart Kb (Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced after July 23, 1984) is also not applicable. Per §60.110b(b), storage vessels with a design capacity less than 75 cubic meters (19,815 gallons) are exempt from the General Provisions (Subpart A) and the provisions of this subpart.

Alternative Operating Scenarios:

Temporary replacement of the 1,100 kW diesel engine generator from the site is allowed provided the following provisions are adhered to:

- a. Written notification identifying the reason(s) for the removal and temporary replacement of the diesel engine generator from the site of operation is submitted to and approved by the Department of Health prior to the exchange;

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- b. The temporary replacement unit is the same size or smaller with equal or lessor emissions;
- c. The temporary replacement unit complies with all applicable conditions including all air pollution control equipment requirements, operating restrictions, and emission limits;
- d. The diesel engine generator shall be repaired and returned to service at the same location in a timely manner;
- e. Prior to the removal and return of the diesel engine generator, the permittee shall submit to the Department of Health written documentation of the removal and return dates and on the make, size, model and serial numbers for both temporary replacement unit and the installed unit;
- f. The permittee shall also submit any additional information as requested by the Department of Health, which may include an ambient air quality impact assessment verifying that the State Ambient Air Quality Standards are met;
- g. The permittee shall, contemporaneously with making a change from one operating scenario to another, record in a log at the permitted facility the scenario under which it is operating and, if required by any applicable requirement or the Department of Health, submit written notification to the Department of Health; and;
- h. The terms and conditions under each operating scenario shall meet all applicable requirements, including the special conditions of this permit.

Major Source Applicability:

A major source as defined in §11-60.1-1 of HAR Title 11, has the potential to emit any HAP of 10 TPY or more, or 25 TPY or more of any combination of HAPs, or 100 TPY or more of any air pollutant. Calculated emissions do not meet these limits, and thus, this facility is not classified as a major source.

Synthetic Minor Applicability:

A synthetic minor source is a facility that is potentially major (as defined in HAR §11-60.1-1), but is made nonmajor through federally enforceable permit conditions (e.g., limiting the facility's hours of operation and limiting the facility's production rate). This facility is a synthetic minor based on potential emissions (NO_x and PM) of greater than

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“major” levels (> 100 TPY) when the facility is operated at 8,760 hr/yr. See enclosures for detailed calculations.

Project Emissions:

The emissions calculations provided on Form S-1 were checked and modified using the most current AP-42 Factors (Tables 3.4-1, 3.4-2, 3.4-3, 10/96; 11.19.2-2, 8/04; and Sections 13.2.2, 12/03; and 13.2.4, 1/95)

The data below summarizes the Department of Health’s emission calculations, performed in Enclosures (1a), (1b), (1c), (2), (3), and (4).

Worst case emissions (using the maximum equipment capacities) from the stone processing were calculated and are shown in Enclosures (1a), (1b), and (1c). Operations are based on 2,080 hrs/yr per the applicant’s proposal.

Worst case emissions from aggregate handling and storage piles were calculated and are shown in Enclosure (2). Worst case emissions from unpaved road traffic (truck travel) are shown in Enclosure (3).

Worst case emissions from the 1,100 kW diesel engine generator were calculated assuming 2,080 hours of operation a year firing diesel no. 2 at the manufacturer specified maximum fuel feed rate of 74.4 gph. All emission calculations were based on a heating value for diesel no. 2 of 137,000 Btu/gal. Calculated emissions from the generator are shown in Enclosure (4).

Calculations show that the majority of PM emissions are fugitive in nature and are generated by vehicle traffic on the unpaved roads and stockpiles. Please refer to the attached spreadsheets for details.

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Table 3 - Facility Emissions Summary ^{a,c}

Pollutant	Stone Processing Plant (TPY)	Agg Hand/Storage Piles (TPY)	Unpaved Roads (TPY)	1,100 kW Diesel Engine Generator (TPY)	Total Emissions including fugitive (TPY)	Significant Level (TPY)	Type B CERR Trigger Level ^b (TPY)	In-house Total Facility Trigger Level ^c (TPY)
SO _x	-	-	-	5.45	5.45	40	100	≥25
NO _x	-	-	-	34.05	34.05	40	≥100	≥25
CO	-	-	-	9.01	9.01	100	≥1000	≥250
PM	2.13	3.16	7.64	1.06	13.99	25	-	≥25
PM ₁₀	0.84	1.49	2.26	0.61	5.20	15	≥100	≥25
PM _{2.5}	0.19	0.47	0.35	0.59	1.60	-	≥100	-
VOC	-	-	-	0.95	0.95	40	≥100	≥25
Pb	-	-	-	-	-	0.6	-	-
Be	-	-	-	-	-	0.0004	-	-
Hg	-	-	-	-	-	0.1	-	-
HAPS	-	-	-	4.62 E-02 ^d	-	-	-	≥5

^a TPY are calculated for 2,080 hr/yr of operation.

^b Based on actual emissions.

^c Based on potential emissions.

^d See Table 4 for details.

Table 4 - Emissions Summary for Hazardous Air Pollutants (HAPS) and Other Trace Elements/Speciated Organic Compounds

POLLUTANT	1,100 kW Diesel Engine Gen. Emissions (lb/hr)	1,100 kW Diesel Engine Gen. Emissions at 2,080 hrs/yr (TPY)
Benzene*	7.91e-03	8.23e-03
Toluene*	2.86e-03	2.98e-03
Xylenes*	1.97e-03	2.05e-03
Propylene*	2.84e-02	2.95e-02
Formaldehyde*	8.04e-04	8.36e-04
Acetaldehyde*	2.57e-04	2.67e-04
Acrolein*	8.03e-05	8.35e-05
Naphthalene*	1.33e-03	1.38e-03
PAH (Polycyclic Aromatic HC's)*	2.16e-03	2.25e-03
TOTAL HAPS* (TPY)		4.62e-02

* Hazardous air pollutants listed in the Clean Air Act and HAR 11-60.1 Subchapter 9. PAH includes Naphthalene.

Air Quality Assessment:

The ambient air quality standards seek to protect public health and welfare and to prevent the significant deterioration of air quality.

For new facilities and facilities proposing modifications, an ambient air quality assessment is required to analyze the maximum potential pollutant concentrations generated by a source and its effect on the ambient air.

The Department of Health generally exempts an applicant from performing an ambient air quality impact analysis for (1) existing sources with no proposed modifications, (2) exempt activities, (3) fugitive emission sources (e.g., storage tanks, storage piles, pipe leaks, etc.), and (4) intermittent operating noncombustion sources.

This facility is proposing to install a new portable stone crushing plant. However, being that the Department of Health does not require an ambient air quality impact analysis for fugitive emissions of particulate, an ambient air quality impact analysis was not performed for the portable stone crushing plant.

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The 1,100 kW diesel engine generator used to run the crushers, screen, and conveyors requires an ambient air quality analysis. A Good Engineering Practice (GEP) analysis, presented in Table 5 reveals the potential for building downwash:

Table 5 - GEP Analysis (1,100 kW Diesel Engine Gen. Stack)

Bldgs/ Structures	Hb Hght (m)	Length (m)	Width (m)	Pw Proj. Width (m)	L Lesser of 5Hb and 5Pw	Dist to stack (m)	Hg = Hb + 1.5(the lesser of Hb or Pw) (m)
Diesel Housing	4.0	13.4	2.4	13.61	20	0.0	10.0
Jaw Crusher	7.6	13.7	2.4	13.91	38	7.3	19.0
Torgeson Crusher /Eljay Screen	6.1	9.1	2.4	9.41	30.5	13.7	15.3

The jaw crusher will have the greatest effect for building downwash for the diesel engine generator stack. This structure was entered into the SCREEN3 model used to predict maximum ground level pollutant concentrations resulting from the diesel engine generator.

Table 6 - Source Emission Rates and Stack Parameters for Air Modeling

Source	Emission Rates				Stack Parameters			
	SO ₂ (g/s)	NO _x (g/s)	CO (g/s)	PM ₁₀ (g/s)	Height (m)	Temp (K)	Velocity (m/s)	Diameter (m)
Diesel engine (Caterpillar)	0.6602	4.1257	1.0916	0.0736	7.0	730.8	56.4567	0.305

Grams per second emission rates are based on AP-42 emission factors or manufacturer's emission data (whichever were greater). Based on these assumptions, the modeling performed demonstrated compliance with the ambient air quality standards.

SCREEN3 was used to determine ambient concentration for complex terrain from the diesel engine generator. The model predicted a 24-hr concentration of 25.51 µg/m³ per g/sec at the property fenceline, which is 457 meters from the stack. Other settings used: 1) rural designation, 2) default met data and 3) ambient temperature of 298 K.

Table 7
Conversion Factors and Normalized Concentrations from Modeling Results

	Complex Terrain Valley	
Averaging Period	Conversion Factor	Normalized Concentration ($\mu\text{g}/\text{m}^3$ per g/sec) at property fenceline
1-hour	0.25	102.04
3-hour	0.9	91.84
8-hour	0.7	71.43
24-hour	NA	25.51
Annual	0.2	20.41

Bold entry is the model result.

SCREEN3 outputs a 24-hour concentration for complex terrain. Conversion factors were used to convert the 24-hour concentration to represent 1-hour, 3-hour, 8-hour, and annual estimates. The conversion factors are based on EPA and State of Hawaii (annual) scaling factors as shown in the table above. Results of the ambient air quality analysis are shown in Table 8.

Table 8
Predicted Ambient Air Quality Impacts

POLLUTANT	AVER. TIME	IMPACT ($\mu\text{g}/\text{m}^3$)	Back-ground ($\mu\text{g}/\text{m}^3$)	TOTAL IMPACT ($\mu\text{g}/\text{m}^3$)	SAAQs ($\mu\text{g}/\text{m}^3$)	Percent of Standard
CO	1-hr	111.39	2394	2505.39	10000	25.05%
	8-hr	77.97	983	1060.97	5000	21.22%
NO ₂ *	Annual**	15.00	9	24.00	70	34.29%
SO ₂	3-hr	60.63	17	77.63	1300	5.97%
	24-hr	16.84	7	23.84	365	6.53%
	Annual**	3.20	1	4.20	80	5.25%
PM ₁₀	24-hr	1.88	28	29.88	150	19.92%
	Annual**	0.36	16	16.36	50	32.72%

* For NO₂ calculations, the Tier 2 Ambient Ratio Method (ARM) of converting NO_x to NO₂ (75% of NO_x) was applied.

** Annual hour limitation factor of 0.24 applied. Hour limitation factor = (2,080 hr/year) / (8,760 hr/year) = 0.24

The background air quality data shown in Table 8 was obtained from the maximum

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values of 2004 Hawaii Air Quality Data (DOH/CAB) taken from the Kapolei station (CO, SO₂, NO₂) and Lihue station (PM₁₀).

The State Ambient Standards are stricter than the National Ambient Standards; therefore, only the State Standards are listed. Although the CO, SO₂ and NO₂ background concentrations were taken from areas other than Koloa, Kauai, these areas are considered representative or more conservative than the Koloa, Kauai area due to their population and industrial development.

Analysis of the facility is based on operation of the 1,100 kW diesel engine generator at 2,080 hours/year.

The combined effect of 1) maximum concentrations generated by the 1,100 kW diesel engine generator and 2) ambient background concentrations, demonstrate compliance with the State Ambient Air Quality Standards and Federal Ambient Air Quality Standards.

Significant Permit Conditions:

Condition: The total operating hours of the 357 TPH portable crushing plant including the 1,100 kW diesel engine generator shall not exceed two-thousand eighty 2,080 hours in any rolling twelve (12) month period.

Purpose: The applicant has proposed 2,080 hours as the maximum hours of operation per year to ensure the facility complies with the ambient air quality standards for NO₂. Monitoring of the annual limitation will be achieved through the use of a non-resetting hour meter on the diesel engine generator.

Condition: 40 CFR Part 60 Subpart OOO provisions are applicable to the crushers, screens, and conveyors. The permittee shall comply with all applicable provisions of these standards, including all emission limits and all notification, testing, monitoring, and reporting requirements.

Purpose: To specify equipment subject to 40 CFR 60, Subpart OOO, Standards of Performance for Nonmetallic Mineral Processing Plants.

Condition: The permittee shall not cause to be discharged into the atmosphere from any transfer point on the belt conveyors or from any other affected facility any fugitive emissions which exhibit greater than ten (10) percent opacity.

Purpose: This condition required by NSPS (40 CFR §60.672(b)).

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Condition: The permittee shall not cause to be discharged into the atmosphere from any crusher, fugitive emissions which exhibit greater than fifteen (15) percent opacity.

Purpose: This condition required by NSPS (40 CFR §60.672(a)).

Condition: Initial and annual source performance tests shall be conducted pursuant to Special Condition, Section F. Test summaries and results shall be maintained in accordance with the requirements of this section.

Purpose: The facility is subject to 40 CFR 60, Subpart OOO, Standards of Performance for Nonmetallic Mineral Processing Plants. An initial and annual source performance test is required for the measurement of opacity. The annual source performance test is a State requirement to help ensure the facility is operating in compliance with the ambient air quality standards.

Conclusion and Recommendation:

Actual emissions from this facility should be lower than estimated based on the following reasons:

1. The calculated project emissions were based on the potential worst possible conditions (maximum rated capacity, 357 TPH) of the crushing plant. Actual crushing capacity will vary depending on product size and the type of material. Manufacturer's specifications identify a range of 178 to 357 TPH.
2. Calculations were based on 2,080 hours a year of operations for the facility and 1,100 kW diesel engine generator. However, stone processing operations will be on a temporary basis with intermittent periods of operation, contingent upon jobs performed. The applicant projected 8 hours operation a day, 5 days/week, with periods of time where the facility will sit idle in between jobs.

Based on the information submitted by Kiewit Pacific Co., it is the determination of the Department of Health (DOH), that the proposed project will be in compliance with the Hawaii Administrative Rules (HAR), Chapter 11-60.1 and State and Federal ambient air quality standards. Therefore, recommend issuance of a Temporary Covered Source Permit for Kiewit Pacific Company subject to the incorporation of the significant permit conditions, 30-day public comment period, and 45-day review by EPA.

Darin Lum
9/06