

Initial Covered Source Permit (CSP) No. 0355-02-CT Review
Application No. 0355-02

Applicant: West Hawaii Concrete

Equipment Description:

This permit application includes portable stone processing equipment which is proposed to be initially operated with the following two (2) configurations:

800 tph plant w/ 545 kW diesel engine generator (DEG)

1. Grizzly feeder;
2. 800 tph Cedarapids initial jaw crusher (model no. 3042, serial no. 43383);
3. 155 tph Symons shorthread cone crusher (model no. 41/4, serial no. 40047);
4. 6'x20' screen;
5. 5'x16' screen;
6. 250 tph Cedarapids horizontal rotor secondary impactor (model no. 5048, serial no. 43411);
7. 545 kW Caterpillar DEG (model no. 3412, serial no. 81Z09602, max. 39.9 gph fuel oil no. 2, stack height at 23 ft.);
8. Various conveyors; and
9. Watersprays

1,130 tph plant w/ 1,000 kW DEG

1. Grizzly feeder;
2. 1,130 tph Cedarapids initial jaw crusher (model no. 4248, serial no. 52073);
3. Two (2) 8'x20' Cedarapids triple deck screens (serial nos. 52075 and 52076);
4. 645 tph Cedarapids ElJay cone crusher (model no. MVP 450, serial no. 52074);
5. 400 tph Canica vertical shaft impactor (model no. 100, serial no. 100368-03);
6. 1,000 kW Cummins DEG (model no. 1000DFHD, serial no. 2177-03, max. 63.3 gph fuel oil no. 2, stack height at 23 ft.);
7. Various conveyors; and
8. Watersprays

545 kW Caterpillar DEG (model no. 3412, serial no. 81Z10333, max. 39.9 gph fuel oil no. 2, stack height at 23 ft.); as a back-up or simultaneous operation for either location

Initial 800 tph w/ 545 kW DEG Location: Waikoloa Quarry
Waikoloa, HI 96738 (Hawaii)
UTM: 198,660 E, 2,201,600 N (NAD-83)

Initial 1,130 tph w/ 1,000 kW DEG Location: Kona Quarry
Kona, HI 96738 (Hawaii)
UTM: 813,270 E, 2,179,050 N (NAD-83)

Mailing Address: P.O. Box 1390
Kailua-Kona, Hawaii 96745

Responsible Official/Contact:	Consultant:
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Proposed Project:
SICC is 1429.

Although this is an initial CSP review, this is an existing source with some modifications. This equipment was previously permitted as a noncovered source to be owned and operated by Oahu Construction Company, Ltd. However, after the transfer of ownership to West Hawaii Concrete and relocation from Oahu to Hawaii on March 23, 2000, it was discovered that the equipment was subject to NSPS OOO because of the manufacture date.

The applicant proposes to operate portable stone processing equipment initially at the two (2) locations stated above. The locations have been reviewed at the worst case scenarios in anticipation of slight modifications to the plant configurations. It is also possible that one of the impact crushers will be separated to a third site to produce sand. In any event, the maximum potential emissions at each plant site will remain below 100 tpy, since temporary sources are not allowed to be major sources as defined in 11-60.1-81.

This is a typical stone processing operation with the loading of large rock by front end loaders (fugitive emissions) into feeders. Conveyor belts transfer the rock in between crushers, screens, and stock piles. The worst case scenario includes the 1,130 tph plant (fugitive emissions) with 1,000 kW and 545 kW DEGs (point emission) as listed above. As shown in the **Ambient Air Quality Assessment** section, the modeled air pollutant concentrations were highest using simple terrain rather than complex terrain at both locations.

This permit review is based on the application dated 8/30/02 and its revisions dated 2/21/03, 2/25/03, 5/1/03, 7/18/03, and 8/1/03. The application fee of \$1,000.00 for an initial, non-air toxic, temporary covered source permit was previously processed and the receipt will be issued with the permit.

Air Pollution Controls:

1. Water sprays will be used at the unpaved roadways and aggregate stockpiles to control fugitive dust. Water sprays will also be used at critical points at the plant(s) to assure compliance with the 40 CFR Subpart OOO visible emissions standards. 70% reduction in particulate matter (PM) is assumed for the use of water sprays.
2. PM and sulfur dioxide (SO₂) emissions from the 1,000 kW DEG are controlled with the low sulfur and ash content of the fuel used. NO_x emissions from the 1,000 kW DEG is controlled with the use of a turbocharger, aftercooler, and proper maintenance/operation.
3. CO and VOC emissions from the 1,000 kW DEG is controlled with proper maintenance/operation.

The emissions controls for the 1,000 kW DEG are not considered as add-on controls. They are new technology that complies with EPA Tier 1 standards for nonroad engines. The emission rates used are the manufacturer's data and therefore have no further reduction factors.

Applicable Requirements:

Hawaii Administrative Rules (HAR) Title 11 Chapter 59 - Ambient Air Quality Standards
Hawaii Administrative Rules (HAR) 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, Sections 111,112-115
 Subchapter 8 - Standards of Performance for Stationary Sources
 Subchapter 10 - Field Citations

New Source Performance Standards (NSPS), specifically 40 CFR Part 60 Subpart OOO - Standards of Performance for Nonmetallic Mineral Processing Plants since the portable production capacities of the plants are over 150 tph and the manufacture dates of the equipment are after August 31, 1983.

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

Synthetic Minor since the 1,130 tph plant would be a major source (≥ 100 tpy of PM and NO_x) if it operated continuously.

Non-Applicable Requirements:

National Emission Standards for Hazardous Air Pollutants (NESHAPS) and Maximum Achievable Control Technology (MACT) since there will be no significant emission of HAPs.

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

Consolidated Emissions Reporting Rule (CERR) since each potential air pollutant emission for the facility is less than 100 tpy.

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 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 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 boilers since items 1,3, and 5 do not apply.

BACT Requirements:

Best Achievable Control Technology (BACT) review is applicable to the stone processing since the maximum potential of particulate matter is above significant levels (>25 tpy). The applicant has proposed the use of water sprays as air pollution control. The use of water sprays is considered BACT since it is known to reduce PM by 70%.

BACT is not applicable to the DEGs since each criteria air pollutant is below thresholds. The fuel limits of 305,000 gal/yr and 225,000 gal/yr for the 1,000 kW and 545 kW DEGs respectively will ensure that these thresholds will not be exceeded. This determination is equipment specific but not site specific. See **Project Emissions**.

Insignificant Activities/Exemptions:

The facility is not proposing any insignificant activities or exemptions.

Alternate Operating Scenarios:

1. In the event that a DEG becomes inoperable and the back-up DEG is already in use, a temporary DEG of the same size or smaller will be used.
2. In the event that a stone processing equipment becomes inoperable, a temporary stone processing equipment of the same size or smaller will be used.

Project Emissions:

As mentioned in the **Proposed Project** section, the listed equipment may be swapped between job sites, but shall be limited so that any potential air pollutant emissions at any one (1) site remain below 100 tpy - specifically PM. As stated in HAR 11-60.1-81, a temporary source is required to be non-major. The majority of the air pollutant emissions for this facility will be PM and PM₁₀ from the stock piles, grizzly feeders, crushers, screeners, conveyor transfer points, truck loading, and unpaved roads (fugitive sources). All fugitive emissions, including unpaved roads, are considered for State major source determinations. The project emissions were calculated using current AP-42 Factors and manufacturer's data:

- 3.4 - Large Stationary Diesel Engines (10/96)
 - 11.19.2 - Crushed Stone Processing (1/95)
 - 13.2.2 - Unpaved Roads (9/98)
 - 13.2.4 - Aggregate Handling and Storage Piles (1/95)
- Cummins Exhaust Emission Data Sheet for model no. 1000DFHD

TABLE 1 represents the maximum facility wide air pollutant emissions based on operating at maximum design capacity with operating limitations and continuously. As shown in **TABLE 1**, the potential individual air pollutant emissions for the worst case scenario at any one (1) site will not exceed 100 tpy with the operating restrictions. Since the individual air pollutant emissions would be greater than 100 tpy when operating at maximum capacity for 8,760 hr/yr this is a synthetic minor source. For detailed emission factors, throughput rates, control efficiencies, and calculations see Appendix A of the revision to application dated 5/1/03 and its revision dated July 18, 2003.

The overall fuel limits of 305,000 gal/yr and 225,000 gal/yr for the 1,000 kW and 545 kW DEGs respectively will ensure that BACT thresholds will not be exceeded. This determination is equipment specific but not site specific. As shown in **TABLE 1**, the potential NO_x emissions is the limiting factor. Therefore, the overall fuel limits will ensure that the maximum NO_x emissions will be 38.7 tpy and 38.3 tpy for the 1,000 kW and 545 kW DEGs respectively (below 40 tpy BACT threshold).

PROPOSED
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 August 21, 2003

TABLE 1
WORST CASE PROJECT EMISSIONS AT ANY ONE (1) PLANT

	1,130 TPH PLANT ^{1,2}	UNPAVED ROADS ^{1,2}	STORAGE PILES ^{1,2}	545 kW DEG ³	1,000 kW DEG ³	TOTAL ⁴ W/ LIMITS	TOTAL ⁵ 8,760 HR/YR	SIGNIFICANT LEVEL
	(TPY)	(TPY)	(TPY)	(TPY)	(TPY)	(TPY)	(TPY)	(TPY)
NO _x				20.4	24.1	44.5	>100	40
CO				0.7	2.5	3.2		100
SO ₂				4.2	6.7	10.9		40
VOC				0.2	0.5	0.7		40
PM	29.53	62.62	2.1	1.2	0.3	95.75	>100	25
PM ₁₀	14.17	13.01	1.0	1.2	0.3	29.68	>100	15
Acetaldehyde				2.11e-04	3.35e-04	5.46e-04		
Acrolein				6.60e-05	1.05e-04	1.71e-04		
Benzene				6.50e-03	1.03e-02	1.68e-02		
Formaldehyde				6.61e-04	1.05e-03	1.71e-03		
Toluene				2.35e-03	3.74e-03	6.09e-03		
Xylenes				1.62e-03	2.57e-03	4.19e-03		
Total PAH				1.78e-03	2.82e-03	4.60e-03		

Note:

1. Includes 70% efficiency for the use of water sprays at these locations.
2. Includes a maximum production rate of 2,000,000 tpy of stone.
3. Includes a maximum operation of 119,700 gal/yr and 189,900 gal/yr of fuel oil no. 2 per location for the 545 kW and 1,000 kW DEGs respectively.
4. Sum of the individual emission sources with operating limits.
5. This plant would be a major source if it operated continuously (8,760 hr/yr).

Ambient Air Quality Assessment:

An ambient air quality assessment (AAQA) was performed using SCREEN3 (Version 96043), to determine source compliance with Federal and State ambient air quality standards (NAAQS and SAAQS). The model, methodology and assumptions employed in the AAQA have been determined to be consistent with State and Federal guidelines and are discussed below.

The assumptions used in the SCREEN3 model included the following: simple and complex terrain impacts, rural dispersion parameters, regulatory default, and no flagpole receptors.

The worst case scenario was modeled to show compliance. This includes the simultaneous operation of the 1,000 kW and 545 kW DEGs at one particular location.

At both locations the terrain is generally sloped with quarry walls. Therefore, the AAQA in the 5/1/03 revision considered simple and complex terrain for both locations. The results showed that the simple terrain had the highest concentrations by far. As such, the revised AAQA in the 7/18/03 revision only considered simple and complex terrain at one location. Again the simple terrain had the highest concentrations by far. The revision included the fuel limitations of 119,700 gal/yr and 189,900 gal/yr of fuel oil no. 2 for the 545 kW and 1,000 kW DEGs respectively and stack extensions to 23 feet.

The dominant structure was determined to be the grizzly feeder, which is connect to the initial jaw crusher. Therefore, its dimensions were used in the model to determine downwash effects.

TABLE 2 presents the potential to emit/allowable emission rates and stack parameters of the 545 kW and 1,000 kW DEGs. The derivation of SO₂, NO_x, CO, and PM₁₀ emission rates were previously discussed in the **Project Emissions** section. No results were provided for Pb and H₂S because these pollutants are not expected at this facility.

The predicted concentrations in **TABLE 3** were determined with the assumption of the fuel limitations, stack extensions, and Tier 2 for NO₂ concentrations. Background concentrations were taken from Kona, Big Island and West Beach, Oahu. Based on these assumptions, the facility should comply with State and Federal AAQS for SO₂, NO₂, CO, and PM₁₀.

TABLE 2
SOURCE EMISSION RATES AND STACK PARAMETERS FOR AIR MODELING

SOURCE ¹		EMISSION RATES					STACK PARAMETERS			
Equipment	Stack No.	SO ₂ (g/s)	NO _x (g/s)	CO (g/s)	PM ₁₀ (g/s)	Pb ² (g/s)	Height (m)	Temp. (K)	Velocity (m/s)	Diameter (m)
1,000 kW DEG	1	0.564	2.025	0.206	0.030	--	7.01	766	64.8	0.254
545 kW DEG	2	0.355	1.714	0.060	0.105	--	7.01	750	69.9	0.203
545 kW DEG	3	0.355	1.714	0.060	0.105	--	7.01	750	69.9	0.203

Note:

1. Only two (2) DEGs may operate simultaneously at a site.
2. Lead emission rates are not expected and therefore not modeled.

PROPOSED
Reviewed by: CS
 August 21, 2003

TABLE 3
PREDICTED AMBIENT AIR QUALITY IMPACTS FOR SCENARIO 1

AIR POLLUTANT	AVERAGING TIME	1000 kW DEG ($\mu\text{g}/\text{m}^3$)	545 kW DEG ($\mu\text{g}/\text{m}^3$)	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 ² LOCATION
SO ₂	3-Hour	159	112	60	331	1300	25%	
	24-Hour	71	50	25	145	365	40%	
	Annual ³	12	9	8	29	80	36%	
NO ₂	Annual ^{3,4}	33	31	6	69	70	99%	
CO	1-Hour	65	21	1596	1682	10000	17%	
	8-Hour	45	15	1012	1072	5000	21%	
PM ₁₀	24-Hour	4	15	28	47	150	31%	
	Annual ³	1	3	18	21	50	42%	
Pb ⁵	Calendar Quarter	--		--	--	1.5	0%	--
H ₂ S ⁵	1-Hour	--		--	--	35	0%	--

Note:

1. The background concentrations are the highest of the previous three years taken from Kona, Hawaii for PM₁₀ and SO₂ and West Beach, Oahu for NO₂ and CO.
2. The location of impacts are radial distances of 50m for the 545 kW DEG and 42m for the 1,000 kW DEG.
3. Annual emissions included an operating limit of 119,700 gal/yr and 189,900 gal/yr of fuel oil no. 2 for the 545 kW and 1,000 kW DEGs respectively.
4. Tier 2 was used to calculate NO₂ emissions (0.75 of NO_x emissions).
5. Pb and H₂S emissions are not expected at this facility.

Other Issues:

None.

Significant Permit Conditions:

- NSPS OOO requirements including opacity standards (because of the stone processing equipment capacities and date of fabrication).
- Maximum opacity 20% for the DEGs (because of state rules).
- Site specific fuel limitations of 119,700 gal/yr and 189,900 gal/yr of fuel oil no. 2 for the 545 kW and 1,000 kW DEGs respectively (to meet NO_x SAAQS).
- Overall fuel limitations of 225,000 gal/yr and 305,000 gal/yr of fuel oil no. 2 for the 545 kW and 1,000 kW DEGs respectively (to ensure that potential NO_x will remain below significant levels).
- Stack extensions for all DEGs to 23 feet (to meet NO_x SAAQS).
- Standard dust mitigation and waterspray conditions (BACT for stone processing PM emissions).
- Maximum 2,000,000 ton/yr of processed stone per site and monitored by weigh tickets since the equipment may operate with utility power (to ensure that potential PM will remain below major source levels).
- Alternate operating scenarios for replacement DEGs and stone processing equipment (operational flexibility for the applicant).

Conclusion and Recommendation:

In conclusion, the facility complies with all State and Federal laws, rules, regulations, and standards with regards to air pollution. Therefore, an Initial Temporary Covered Source Permit for West Hawaii Concrete subject to the above special permit conditions is recommended based on the information provided in the air permit application and subject to the following:

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