PERMIT APPLICATION REVIEW
COVERED SOURCE PERMIT NO. 0257-01-C
Renewal Application No. 0257-03
Application for Modification No. 0257-04

Applicant: Jas. W. Glover, Ltd.

Location: Halfway Bridge Quarry, Puhi, Kauai

Responsible Official:	John Romanowski	**Contact:**	David Pirie
Title:	Vice President	**Title:**	Manager
Company:	Jas. W. Glover, Ltd.	**Company:**	Jas. W. Glover
Address:	P.O. Box 579 Honolulu, Hawaii 96809	**Address:**	P.O. Box 1929 Lihu'e, Hawaii 96766
Phone:	808-591-8877	**Phone:**	808-245-3609
		Cell:	808-635-2311

Contact: James W. Morrow
Title: Consultant
Address: 1481 South King Street
Honolulu, Hawaii 96814
Phone: 808-942-9096

1. Background

1.1 Jas. W. Glover, Ltd. has applied for a permit renewal/modification to operate its 1,100 ton per hour (TPH) fixed plant and 800 TPH portable/fixed plant to process aggregate at the Halfway Bridge Quarry on Kauai. Both plants will operate as stationary sources (sources at one location). The portable/fixed plant was considered a temporary source (source that moves from one location to another); however, the applicant has not moved this plant for years and is now designating the plant to be a stationary source. Some of the equipment for the portable/fixed plant is mounted to trailers with wheels for relocation on site. The applicant has also constructed concrete foundations for mounting portable/fixed plant units to enable the equipment to be cleaned. The quarry is a supplier of crushed aggregate in various grades from base course to basaltic termite barrier (BTB) to number three rock commonly used in decorative gardens to sand. Currently, the fixed plant is limited to 4,500 hours per year operation and the portable/fixed plant is restricted to operating not more than 2,950 hours per year. The source industrial classification code (SIC) for this facility is 1429 (Crushed and Broken Stone, Not Elsewhere Classified).

1.2 Both fixed and portable/fixed plants are powered by diesel engine generators. The fixed plant is equipped with a 1,326 hp/1,030 kW diesel engine generator fired on fuel oil No. 2 with sulfur content limited to 0.5% by weight. The fixed plant's engine is old and will be replaced by a new 1,322 hp/1,000 kW diesel engine generator for the permit modification. Fuel oil No. 2 for the 1,322 hp/1,000 kW unit will be ultra low sulfur diesel limited by federal regulations to 0.0015% by weight. The 1,326 hp/1,030 kW diesel engine generator will serve as a backup unit after it's replaced by the new unit. The 800 TPH portable/fixed plant is powered by an old 900 hp/701 kW diesel engine generator fired on fuel oil No. 2 with maximum sulfur content limited to 0.5% by weight.

1.3. Telephone conversation with manufacturers (Cedarapids at 1-800-442-0966, Canica at 360-993-0515, and Telsmith at 262-242-6600) of the crushing and screening equipment disclosed most equipment to be manufactured after 1983. Previous information from the applicant was that all processing equipment was manufactured prior to 1983, and therefore, exempt from federal regulations for non-metallic mineral processing plants. See Paragraph 1.9 for unit manufacturing dates and Paragraph 2.2 for applicability to federal regulations for non-metallic mineral processing plants.

1.4. The applicant requested the following revisions for the permit renewal: (1) change the rating of the primary jaw crusher for the fixed plant from 750 TPH to 1,100 TPH (this is the manufacturer's rating for a 3648 jaw), (2) change the rating of the primary jaw crusher for the portable/fixed plant from 660 TPH to 800 TPH (this is the manufacturer's rating for a 3042 jaw), (3) remove conditions that reference utility power requirements because utility power is no longer available at the site, (4) decrease the hours allowed for operating the fixed plant from 4,500 hours per year to 4,000 hours per year, and (5) add a new diesel engine generator, screen, and new wash conveyor to permitted equipment.

1.5 The Jas. W. Glover, Ltd. crushing and screening facility was inspected at Halfway Bridge Quarry on March 23, 2011. Pictures from the inspection are shown in Enclosure (1). The inspection disclosed an asphalt plant and concrete batch plant operating at the same site as the crushing and screening facility. The applicant indicated that both the asphalt and concrete batch plants are supplied with aggregate from the crushing and screening facility operating on site that is permitted under 0257-01-C. According to EPA policy, emissions from sources that are located on the same property may need to be aggregated in order to determine the category of permitting required (e.g., major Title V source and major stationary prevention of significant deterioration (PSD) source). In order to require aggregation of emissions from collocated sources, all three criteria must be met: (1) contiguous or adjacent property, (2) common control, and (3) same first two digit SIC code. In addition, a support facility is considered to be part of the same SIC code even if the support facility has a different first to digit SIC code. Pursuant to EPA guidance, where more than 50% of the output or services provided by one facility is dedicated to another facility that it supports, then a support facility relationship exists.

1.6 The asphalt plant (SIC 2951) and crushing and screening facility (SIC 1429) at Halfway Bridge Quarry are both operated by Jas. W. Glover, Ltd. The asphalt plant is permitted under CSP No. 0464-01-C. Although these plants are under common control, the crushing and screening plants are not considered support facilities for the asphalt plant. Based on information from the applicant, less than 50% (about 10%) of the aggregate from crushing and screening at the site is supplied to the asphalt plant. Therefore, the asphalt plant can be considered a separate entity for permitting purposes.

1.7 The concrete batch plant (SIC 3272) is operated by Glover Honsador, LLC at the Halfway Bridge Quarry that is permitted under Noncovered Source Permit (NSP) No. 0207-01-N. Although, the concrete batch plant is operated by a different company than the crushing and screening facility permitted under CSP No. 0257-01-C, the Department has determined that the crushing and screening facility and concrete batch plant are under common control because the same responsible official is designated for permitting these sources. The crushing and screening plants; however, are not support facilities for the concrete batch plant because less than 50% (applicant indicated between 25% to 30%) of the product from crushing and screening at the site is supplied to the concrete batch plant. Therefore, the concrete batch plant can be considered a separate entity for permitting purposes.

1.8 The permit data base disclosed a 290 hp diesel engine generator that is currently operated by Jas. W. Glover, Ltd. at the Halfway Bridge Quarry. The 290 hp diesel engine generator is permitted under NSP No. 0664-02-N. The diesel engine generator provides power to the maintenance shop where mobile equipment (e.g., concrete mix trucks, haul trucks, front-end loaders, and excavators) servicing the various processing plants are maintained.

1.9 Plant equipment for the crushing and screening facility is listed as follows:

Equipment Description	Size	Fuel	Model No.	Serial No.	Manufacturing Date	Design Capacity
1,100 TPH Fixed Plant						
Cedarapids Primary Jaw Crusher	NV	---	3648	43231	1992[a]	1,100 TPH[b]
Telsmith Secondary Cone Crusher	NV	---	48S	8422	1973[a]	210 TPH[b]
Canica Tertiary No. 1 Crusher	NV	---	125	125875-88	1988[a]	500 TPH[b]
Telsmith Tertiary No. 2 Gyrasphere Cone Crusher	NV	---	48FC	7755	1966[a]	180 TPH[b]
Simplicity Screen Wash Screen	5'x12'[b]	---	M140BS	2512-M140BS-6211	2006[b]	1,000 TPH[b]
Telsmith 3-deck Screen (largest size 3" opening)	6'x20'	---	NV	313M12892	1989[a]	1,110 TPH[c]
Telsmith Screen (largest size 3/4" opening)	5'x16'	---	NV	343M129	1984[a]	384 TPH[c]
Telsmith Screen (largest size 3/4" opening)	5'x16'	---	NV	343M130	1984[a]	384 TPH[c]
Eagle Material Washer	30"x18'	---	NV	NV	NV	NV
Various Conveyors	NV	---	NV	NV	NV	NV
Hoppers	NV	---	NV	NV	NV	NV
Cummins Diesel Engine Generator	1,322 hp 1,000 kW	Diesel	QS30-G5-NR2	Engine 37245415 Generator J100165902	2010	1,322 hp 1,000 kW
Caterpillar Diesel Engine Generator	1,326 hp[a] 1,030 kW	Diesel	D-399	Engine 35B06439 Generator 82825-40	1967	1,326 hp[a] 1,030 kW
800 TPH Portable/Fixed Plant						
Cedarapids Primary Jaw Crusher	30"x42" jaw	---	3042	41924	1990	800 TPH
Telsmith Secondary Cone Crusher	NV	---	489S	7742	1965	215 TPH
Canica Tertiary Vertical Shaft Impact Crusher	NV	---	100	100104-89	1989	400 TPH
Eljay 2-deck Screen (largest size 3" opening)	5'x16'	---	FSG 5162-26	34C1890	1990	740 TPH[c]
Eljay 3-deck Screen (largest size 1.5" opening)	6'x16'	---	FSG 6163-32	34C06900	1990	624 TPH[c]
McLanahan Screw Washer	44"x33'	---	NV	NV	2010[b]	175 TPH[c]
Various Conveyors	NV	—	NV	NV	NV	NV
Hopper	NV	---	NV	NV	NV	NV
Caterpillar Diesel Engine Generator	900hp[a] 701 kW	Diesel	D-398A	Engine 66B810 Generator 91039-2	1961	900hp[a] 650 kW

Notes: NV = not available.
Note c below based on Cedarapids Pocket Reference Book, 14th Edition, Basic Screen Capacity Table/Formula (based on TPH (total feed to deck) per one square foot of square opening screen cloth).

a: Based on information from equipment manufacturer relating the equipment model and serial numbers to the equipment manufacturing date and capacity as applicable.
b. Manufacturing date and/or equipment capacity was from information provided by the applicant.
c. Based on information from previous permit application review.

2. Applicable Requirements

2.1 Hawaii Administrative Rules (HAR)
Chapter 59, Ambient Air Quality Standards
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
11-60.1-38, 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 Standards of Performance for Compression Ignition Internal Combustion Engines
11-60.1-161(27) Standards of Performance for Nonmetallic Mineral Processing plants
Subchapter 10 – Field Citations

2.2 40 Code of Federal Regulations (CFR) Part 60 – New Source Performance Standards (NSPS), Subpart OOO, Standards of Performance for Non-Metallic Mineral Processing Plants is applicable to most of the crushing and screening equipment because the primary crusher's capacity is greater than 25 TPH and 150 TPH for the fixed and portable/fixed plants, respectively, and the facility has processing equipment that was manufactured after 1983. Part 60 Subpart OOO is not applicable to the Telsmith secondary cone crusher and Telsmith No. 2 gyrasphere cone crusher servicing the 1,100 TPH fixed plant because this equipment was manufactured prior to 1983. Part 60 Subpart OOO is also not applicable to the Telsmith secondary cone crusher servicing the portable/fixed plant because this piece of equipment was manufactured prior to 1983. Pursuant to 40 CFR Part 60 §60.670(a)(2), Subpart OOO is also not applicable to wet material processing operations that process saturated materials. Subpart OOO defines saturated material as mineral material with sufficient surface moisture such that particulate matter emissions are not generated from processing the material through screening operations, bucket elevators, and belt conveyors. As per the applicant, wet material process equipment includes the wash screen at the fixed pant, the screw washers, and other screening and processing equipment that may operate to process either dry or water saturated material.

2.3 40 CFR Part 60 - NSPS Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines is applicable to the new 1,322 hp/1,000 kW Cummins diesel engine generator in accordance with Subpart IIII §60.4200(a)(2)(i) because the unit commenced construction after July 11, 2005 and was manufactured after April 1, 2006. For purposes of Subpart IIII, the date that construction commences is the date the engine is ordered. As indicated by Jas. W. Glover, Ltd., the 1,322 hp/1,000 kW diesel engine was ordered on June 23, 2010 and manufactured in December of 2010.

2.4 40 CFR Part 60 – NSPS, Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines does not apply to the 1,326 hp/1,030

kW and 900 hp/701 kW Caterpillar diesel engine generators because this equipment commenced construction far prior to July 11, 2005 and was manufactured far prior to April 1, 2006. These diesel engine generators were manufactured in the 1960s.

2.5 40 CFR Part 63 - Subpart ZZZZ - National Emissions Standards for Hazardous Air Pollutants (NESHAP) for Stationary Reciprocating Internal Combustion Engines (RICE) is applicable to the new 1,322 hp/1,000 kW Cummins diesel engine generator. Pursuant to Subpart ZZZZ, §63.6590(a)(2)(iii), a stationary RICE is new if it's located at an area source of HAP emissions and commenced construction after June 12, 2006. The new 1,322 hp/1,000 kW diesel engine generator was manufactured in December of 2010 and installation will begin far later than July 12, 2006. Pursuant to 40 CFR §63.6590 (c), new RICE operating at area sources must meet the requirements of 40 CFR, Part 63, Subpart ZZZZ by meeting the requirements of 40 CFR, Part 60, Subpart IIII.

2.6 40 CFR Part 63, Subpart ZZZZ – NESHAP for Stationary RICE is not applicable to the old 1,326 hp/1,030 kW diesel engine generator that will serve as a backup unit after it's replaced by the new 1,322 hp/1,000 kW Caterpillar diesel engine generator. As indicated by the applicant's consultant, this diesel engine generator will operate as a nonroad engine. Nonroad engines are exempt from 40 CFR Part 63, Subpart ZZZZ.

2.7 40 CFR Part 63 - Subpart ZZZZ - NESHAP for Stationary RICE is not applicable to and the old 900 hp/701 kW Caterpillar diesel engine generator for the 800 TPH portable/fixed plant. As indicated by the applicant's consultant, this diesel engine generator will operate as a nonroad engine. Nonroad engines are exempt from 40 CFR Part 63, Subpart ZZZZ.

2.8 The purpose of Compliance Assurance Monitoring (CAM) is to provide reasonable assurance that compliance is being achieved with large emission 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 pre-control emissions that are greater than the major source level; and (5) not otherwise be exempt from CAM. The CAM regulation is not applicable because the crushing and screening facility is not a major source.

2.9.1 The crushing and screening facility is not a major stationary source as defined in the PSD regulations because the plant does not belong to the source categories specified in HAR §11-60.1-131 under definition of a major PSD source and, except for green house gas (GHG) emissions, maximum potential emissions for any regulated pollutant are below 250 TPY. As such, PSD review is not required.

2.9.2 The permit modification/renewal will be issued after January 2, 2011 but before July 1, 2011 and the facility is not subject to PSD permitting for regulated air pollutants other than GHGs. Therefore, GHG emissions are not subject to PSD as part of this permit application review.

2.10 Annual emissions reporting will be required because the facility is a covered source.

2.11 Operation limits for the equipment restrict emissions to levels that are below major source thresholds. Therefore, this facility is a synthetic minor source.

2.12 A best available control technology (BACT) analysis is not required because potential emissions from the modification do not exceed the significant emission levels as defined in

HAR, Section 11- 60.1. The applicant will operate a new diesel engine generator which complies with EPA Tier 2 exhaust emission standards. Emissions from the new unit will be less than those for the old unit. The old diesel engine generator will be a backup unit. The permit will limit diesel engine operation to use of not more than two units at any one time.

The permit will also require that the old 1,326 hp/1,030 kW diesel engine generator be used only as a replacement unit for the new 1,322 hp/1,000 kW diesel engine generator.

2.13 The consolidated emissions reporting rule (CERR) is not applicable because emissions from the facility do not exceed reporting levels pursuant to 40 CFR 51, Subpart A. See table below.

CERR APPLICABILITY			
Pollutant	Facility Emissions (proposed limits with water sprays and water truck)[a]	CERR Triggering Levels (TPY)	
		1 year cycle (type A sources)	3 year cycle (type B sources)
PM_{10}	31.7	≥ 250	≥ 100
SO_2	15.6	≥ 2,500	≥ 100
NO_X	74.3	≥ 2,500	≥ 100
VOC	1.8	≥ 250	≥ 100
CO	12.2	≥ 2,500	≥ 1,000

a: Based on maximum potential emissions from operating equipment at all locations.

3. Insignificant Activities

3.1 Two (2) 2,000 gallon fuel oil No. 2 storage tanks and one (1) 4,000 gallon fuel oil No. 2 storage tank supplying fuel to diesel engine generators powering the fixed plant are an insignificant activities in accordance with HAR §11-60.1-82(f)(1).

3.2 One (1) 2,000 gallon fuel oil No. 2 storage tank supplying fuel to the diesel engine generators powering the portable/fixed plant is an insignificant activity pursuant to HAR §11-60.1-82(f)(1).

3.3 One (1) 250 gallon portable day operating tank that stores fuel oil No.2 is an insignificant activity pursuant to HAR §11-60.1-82(f)(1).

3.4 One (1) 450 gallon tank for engine gear lubrication is an insignificant activity pursuant to HAR §11-60.1-82(f)(1).

3.5 One (1) 50 gallon solvent tank for engine maintenance is an insignificant activity pursuant to HAR §11-60.1-82(f)(1).

4. Alternate Operating Scenarios

4.1 As an alternate operating scenario, the applicant will be allowed to temporarily replace each diesel engine generator with another diesel engine generator of similar or smaller size if replacement is required for the primary diesel engine generator.

5. Air Pollution Control

5.1 Water, shrouds, and semi-enclosed building structures are the methods employed to control fugitive dust from plant process units, stockpiles, and vehicle travel.

5.2 The fixed and portable/fixed plants employ water nozzles and spray bars to control particulate matter emissions. Water is applied directly to the process source (e.g., crushers), or to the processed product (material on conveyors and process stockpiles) to control particulate emissions except where doing so would reduce the efficiency of plant operation. In addition, the facility also employs shrouds and semi-enclosed building structures to control particulate matter emissions from several areas.

5.3 Wet suppression (water sprays and/or an onsite water truck) will be used to control fugitive particulate emissions from process vehicle activities and product stockpiles.

6. Project Emissions:

6.1 Emissions of NO_X, CO, VOC, PM, PM_{10}, and $PM_{2.5}$ were based on emissions data from manufacturer's specifications for all the diesel engine generators. The HAP emissions were estimated using AP-42, Section 3.4 (10/96), Large Stationary Diesel and all Stationary Dual-fuel Engines for equipment above 600 hp. A mass balance calculation was used to determine SO_2 emissions based on the maximum fuel sulfur content of 0.5% and 0.0015% by weight for the old and new diesel engine generators, respectively, and the gallon per hour fuel consumption at 100% load. It was assumed that 96% of the total particulate was PM_{10} and 90% of the total particulate was $PM_{2.5}$ based on AP-42, Appendix B.2, Table B.2-2 for gasoline and diesel fired internal combustion engines. The applicable hour per year operating limits (4,000 hr/yr for fixed plant and 2,950 hr/yr for portable/fixed plant) were used to determine emissions for each diesel engine generator. Emission estimates are shown in Enclosure (2) and summarized below.

1,322 hp/1,000 kW CUMMINS DIESEL ENGINE GENERATOR (NEW)				
Pollutant	Engine Emission Rate		Engine Emissions (TPY)	
	lb/hr	g/s	4,000 hr/yr	8,760 hr/yr
SO_2	0.014[a]	0.002[a]	0.03	0.07
NO_X	11.63	1.469	23.3	51.0
CO	1.69	0.213	3.4	7.4
VOC	-------	--------	0.5	1.0
PM	-------	-------	0.6	1.4
PM_{10}	0.31	0.039	0.6	1.3
$PM_{2.5}$	0.29	0.036	0.6	1.3
HAPs	-------	-------	0.077	0.168

a: Based on fuel sulfur content limited to 0.0015%.

1,326 hp/1,030 kW CATERPILLAR DIESEL ENGINE GENERATOR (OLD)				
Pollutant	Engine Emission Rate		Engine Emissions (TPY)	
	lb/hr	g/s	4,000 hr/yr	8,760 hr/yr
SO_2	5.11	0.645	10.2	20.4
NO_X	24.24	3.060	48.5	96.9
CO	3.96	0.500	7.9	15.8
VOC	-------	--------	0.3	0.7
PM	-------	-------	0.4	0.8
PM_{10}	0.19	0.023	0.4	0.7
$PM_{2.5}$	0.17	0.022	0.3	0.7
HAPs	-------	-------	0.087	0.381

a: Based on fuel sulfur content limited to 0.5%.

900 hp/701 kW CATERPILLAR DIESEL ENGINE GENERATORS (OLD)				
Pollutant	Engine Emission Rate		Engine Emissions (TPY)	
	lb/hr	g/s	2,950 hr/yr	8,760 hr/yr
SO_2	2.79	0.352	5.4	16.0
NO_X	13.61	1.718	25.8	76.5
CO	0.48	0.061	4.3	12.9
VOC	-------	--------	0.3	0.8
PM	-------	-------	0.2	0.7
PM_{10}	0.80	0.101	0.2	0.7
$PM_{2.5}$	0.75	0.094	0.2	0.7
HAPs	-------	-------	0.046	0.201

a: Based on fuel sulfur content limited to 0.5%.

6.2 Particulate emissions from the crushing and screening plants were based on emission factors from AP-42, Section 11.19.2 (8/04), Crushed Stone Processing and Pulverized Mineral Processing. The controlled emission factors were used for crushing, screening and conveyor transfer points. It was assumed that 51% PM was PM_{10} and 15% PM was $PM_{2.5}$ based on information from AP-42, Appendix B.2.2. Uncontrolled emission factors were used for truck loading and unloading operations and a 70% control efficiency for water sprays was applied to determine emissions. A 1,100 TPH aggregate throughput for conveyors situated between primary crusher and cone crusher was used to predict emissions for initial crushing at the fixed plant. An aggregate throughput of 210 TPH was used to estimate emissions for equipment downstream of the fixed plant's cone crusher. For the portable/fixed plant, an aggregate throughput of 800 TPH was used to estimate emissions for initial crushing. An aggregate throughput of 215 TPH was used to estimate emissions for equipment downstream of the portable/fixed plant's secondary crusher. Emissions from the crushing and screening plants are shown in Enclosure (3) and summarized below.

CRUSHING AND SCREENING PLANTS				
Pollutant	1,100 TPH Fixed Plant (4,000 hr/yr)	1,100 TPH Fixed Plant (8,760hr/yr)	800 TPH Portable Plant (2,950 hr/yr)	800 TPH Portable Plant (8,760 hr/yr)
PM	13.6	29.8	7.5	22.3
PM_{10}	5.2	11.4	2.8	8.3
$PM_{2.5}$	0.7	1.5	0.4	1.2

6.3 Particulate emissions from stockpiles were determined using emission factors from AP-42, Section 13.2.4 (11/06), Aggregate Handling and Storage Piles. Emissions were based on a 4,000 hr/yr operating limit for the 1,100 TPH fixed plant and a 2,950 hr/yr operating limit for the 800 TPH portable/fixed plant. Emissions were also based on a 15 mile per hour wind speed, K value for PM_{10} of 0.35, K value for PM of 0.74, K value for $PM_{2.5}$ of 0.053, and a mean 2.525% material moisture content. A 70% control efficiency was applied to account for use of a water truck to control fugitive dust. Emissions are shown in Enclosure (4) and summarized in the table below.

STOCKPILES				
Pollutant	1,100 TPH Fixed Plant (4,000 hr/yr)	1,100 TPH Fixed Plant (8,760hr/yr)	800 TPH Portable Plant (2,950 hr/yr)	800 TPH Portable Plant (8,760 hr/yr)
PM	4.7	10.3	2.5	7.4
PM_{10}	2.2	4.8	1.2	3.6
$PM_{2.5}$	0.3	0.7	0.2	0.6

6.4 Emissions from vehicle travel on unpaved roads were calculated using the emission factor equation for vehicles traveling on unpaved surfaces at industrial sites. The equation was obtained from AP-42, Section 13.2.2 (12/06) Unpaved Roads. Equation (1a) emission factor was extrapolated to annual average uncontrolled conditions using Equation (2). Emission rates were based on the following assumptions:

a. A distance of 62,480 vehicle miles traveled per year for fixed plant based on a 1,100 TPH plant capacity, 4,000 hour per year operation limit, 24 ton load capacity for haul trucks, and 0.17 mile one way travel distance;
b. A distance of 33,433 vehicle miles traveled per year for portable/fixed plant based on an 800 TPH plant capacity, 2,950 hour per year operation limit, 24 ton load capacity for haul trucks, and 0.17 mile one way travel distance;
c. A k value for PM, PM_{10}, and $PM_{2.5}$ of 4.9, 1.5, and 0.15, respectively, based on data for industrial roads;
d. An a value for PM, PM_{10}, and $PM_{2.5}$ of 0.7, 0.9, and 0.9, respectively, based on data for industrial roads;
e. A b value for PM, PM_{10}, and $PM_{2.5}$ of 0.45 based on data for industrial roads;
f. An s (surface material silt content) value of 10%
g. A W (mean vehicle weight) value of 27 tons;
h. An average p (# of days with 0.01" of rain/year) value for Lihue of 200 based on available data from the Hawaii State Climate office; and
i. A 70% control efficiency was applied to account for use of a water truck.
j. Emissions are summarized below as follows:

VEHICLE TRAVEL ON UNPAVED ROADS					
Pollutant	Emission Factor (lb/VMT)	Emissions (TPY)			
		1,100 TPH Fixed Plant (4,000 hr/yr)	1,100 TPH Fixed Plant (8,760hr/yr)	800 TPH Portable/Fixed Plant (2,950 hr/yr)	800 TPH Portable/Fixed Plant (8,760 hr/yr)
PM	5.241	49.1	107.5	26.3	78.1
PM_{10}	1.547	14.5	31.8	7.8	23.2
$PM_{2.5}$	0.155	1.5	3.3	0.8	2.4

6.5 Total yearly emissions for operating the fixed plant are listed below as follows:

TOTAL FIXED PLANT EMISSIONS										
Pollutant	Diesel Engine Generator Emissions (TPY)[a]		Crushing and Screening Emissions (TPY)		Stockpile Emissions (TPY)		Vehicle Travel Emissions (TPY)		Total Emissions (TPY)	
	4,000 hr/yr	8,760 hr/yr	4,000 hr/yr	8,760 hr/yr	4,000 hr/yr	8,760 hr/yr	4,000 hr/yr	8,760 hr/yr	4,000 hr/yr	8,760 hr/yr
SO_2	10.2	20.4	--------	--------	--------	--------	--------	--------	10.2	20.4
NO_X	48.5	96.9	--------	--------	--------	--------	--------	--------	48.5	96.9
CO	7.9	15.8	--------	--------	--------	--------	--------	--------	7.9	15.8
VOC	0.5	1.0	--------	--------	--------	--------	--------	--------	0.5	1.0
PM	0.6	1.4	7.4	16.2	4.7	10.3	49.1	107.5	61.8	135.4
PM_{10}	0.6	1.3	3.5	7.7	2.2	4.8	14.5	31.8	20.8	45.6
$PM_{2.5}$	0.6	1.3	0.5	1.1	0.3	0.7	1.5	3.3	2.9	6.4
HAPs	0.087	0.381	--------	--------	--------	--------	--------	--------	0.087	0.381

a: Based on worst-case emissions between those from the new 1,322 hp Cummins diesel engine generator and the old 1,326 hp/976 kW Caterpillar diesel engine generator.

6.6 Total yearly emissions for operating the portable/fixed plant are listed below as follows:

TOTAL PORTABLE/FIXED PLANT EMISSIONS										
Pollutant	Diesel Engine Generator Emissions (TPY)		Crushing and Screening Emissions (TPY)		Stockpile Emissions (TPY)		Vehicle Travel Emissions (TPY)		Total Emissions (TPY)	
	2,950 hr/yr	8,760 hr/yr	2,950 hr/yr	8,760 hr/yr	2,950 hr/yr	8,760 hr/yr	2,950 hr/yr	8,760 hr/yr	2,950 hr/yr	8,760 hr/yr
SO_2	5.4	16.0	--------	--------	--------	--------	--------	--------	5.4	16.0
NO_X	25.8	76.5	--------	--------	--------	--------	--------	--------	25.8	76.5
CO	4.3	12.9	--------	--------	--------	--------	--------	--------	4.3	12.9
VOC	0.3	0.8	--------	--------	--------	--------	--------	--------	0.3	0.8
PM	0.2	0.7	4.1	12.2	2.5	7.4	26.3	78.1	33.1	98.4
PM_{10}	0.2	0.7	1.7	5.0	1.2	3.6	7.8	23.2	10.9	32.5
$PM_{2.5}$	0.2	0.7	0.3	0.9	0.2	0.6	0.8	2.4	1.5	4.6
HAPs	0.046	0.201	--------	--------	--------	--------	--------	--------	0.046	0.201

a: Based pm emissions from 900 hp/701 kW diesel engine generator.

6.7 Green house gas (GHG) emissions were estimated for operating diesel engine generators at the facility. Green house gases are a single air pollutant defined as an aggregate group of the following six gases: carbon dioxide (CO_2), nitrous oxide (N_2O), methane (CH_4), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). Maximum potential GHG emissions were estimated on a mass basis using AP-42 emission factors from Section 3.4 (10/96), Large Stationary Diesel and all Stationary Dual-fuel Engines. The GHG emissions on a CO_2 equivalent basis were determined with global warming potential (GWP) values listed in PSD and Title V permitting guidance for GHGs prepared by the Office of Air Quality Planning and Standards. The GHG emissions are calculated in Enclosure (2) and summarized in the following table:

GHG	Potential Emissions (TPY)[a]	CO_{2e} Emissions (TPY)[a]
CO_2	3,076.3	3,076.3
CH_4	10.5	220.5
Total ----------→	3,086.8	3,296.8

a: Based on 4,000 hr/yr operation for the 1,326 hp/1,030 kW diesel engine generator for the fixed plant and 2,950 hr/yr operation of the 900 hp/701 kW diesel engine generator for the portable/fixed plant as worst-case scenario.

6.7 Total yearly emissions for operating both the fixed and portable/fixed plants are listed below as follows:

TOTAL FIXED AND PORTABLE/FIXED PLANT EMISSIONS										
Pollutant	Diesel Engine Generator Emissions (TPY)		Crushing and Screening Emissions (TPY)		Stockpile Emissions (TPY)		Vehicle Travel Emissions (TPY)		Total Emissions (TPY)	
	Limited	No Limits	Limited	No Limits	Limited	No Limits	Limited	No Limits	Limited	No Limits
SO_2	15.6	36.4	--------	--------	--------	--------	--------	--------	15.6	36.4
NO_X	74.3	173.4	--------	--------	--------	--------	--------	--------	74.3	173.4
CO	12.2	28.7	--------	--------	--------	--------	--------	--------	12.2	28.7
VOC	0.8	1.8	--------	--------	--------	--------	--------	--------	0.8	1.8
PM	0.8	2.1	11.5	28.4	7.2	17.7	75.4	185.6	94.9	233.8
PM_{10}	0.8	2.0	5.2	12.7	3.4	8.4	22.3	55.0	31.7	78.1
$PM_{2.5}$	0.8	2.0	0.8	2.0	0.5	1.3	2.3	5.7	4.4	11.0
HAPs	0.133	0.582	--------	--------	--------	--------	--------	--------	0.133	0.582

7. Ambient Air Quality Impact Analysis

7.1 An ambient air quality impact analysis (AAQIA) was performed for the 1,322 hp/1,000 kW diesel engine generator that will replace the old 1,326 hp/1,030 kW diesel engine servicing the fixed plant. A Lakes Environmental AERMOD View 6.8.6 ISCST3 model was used by the Department of Health Clean Air Branch to predict air impacts. Model assumptions are listed as follows:

a. Project coordinates were in North American Datum of 1983 (NAD-83);
b. Elevated terrain was used for the AERMOD model. A Digital Elevation Map (DEM) – North American Datum (NAD) 83 file from the KOLOA topographic quadrangle was used with 10 meter resolution for executing the model runs;
c. Rural dispersion parameters were used for the model;
d. A receptor grid with 1,225 receptors was used to determine modeled impacts using a 30 meter x 30 meter receptor spacing. A property line was created in the model from a JEPEG image of the facility from Google Earth. Receptors were used on the property boundary separated by a 30 meter distance. Another receptor grid with 441 receptors was used to expand the area evaluated for air impacts. Receptors for this grid were spaced approximately 50 meters apart from east to west and about 30 meters apart from north to south;
e. Five (5) years of meteorological data from the nearest National Weather Service Station (NWS) was used for the modeling analysis. The NWS data was obtained from the Lihue International Airport for years 2005, 2006, 2007, 2008, and 2009;

f. For determining SO_2, CO, PM_{10}, and $PM_{2.5}$, and annual NO_2 impacts, the yearly meteorological files were connect to create one large five-year meteorological data file for the surface meteorological (.SFC) and profile meteorological (.PFL) files. The Lakes Environmental software determines an average impact for the five years of meteorological data used for the model run;
g. The non-default option for conversion of NO_X to NO_2 was selected in the model to determine 1-hour NO_2 impacts. Conversion was performed in the model using the ozone limiting method. One-hour ozone data supplied to the applicant's consultant from the Department of Health Clean Air Branch was used for the model. The one-hour (1-hour) ozone concentrations were in parts per billion (ppb) and collected every hour of each day for years 2005, 2006, 2007, 2008, and 2009. The data was obtained from the Sand Island air monitoring station located in Honolulu;
h. For estimating 1-hour NO_2 impacts, the model was run separately using each meteorological and ozone data file for each of the five years evaluated and averaged.
i. To determine the NO_2, impact for the annual averaging period, the maximum one-hour (1-hour) emissions rate was reduced by 4,000/8,760 to account for the 4,000 hour per year operating limit; and
j. Conservatively, the maximum hourly emission rate was used to predict PM_{10}, $PM_{2.5}$, and SO_2 impacts for the annual averaging periods.

7.2 The table below lists the emission rates and stack parameters used in the AAQIA.

Source	Emission (g/s)					Stack Parameters			
	SO_2	NO_2	CO	PM_{10}	$PM_{2.5}$	Temp. (^oF)	height (ft)	dia. (in)	Flow Rate (ft^3/min)
1,322 hp/1,000 kW Diesel Engine Generator	0.002[a]	1.469[b] 0.671[c]	0.213[b]	0.039[a]	0.036[a]	872.5	19.0	10.0	6,950

a: Short-term and annual emission rate.
b: Short-term emission rate.
c: Annual emission rate.

7.3 Background concentrations used in the modeling assessment were from the following Department of Health Clean Air Branch ambient air monitoring stations:

a. Makaiwa monitoring station for SO_2;
b. Kapolei monitoring station for NO_2, CO, PM_{10} and $PM_{2.5}$; and
c. Sand Island monitoring station for ozone.

7.4 Background concentrations were from air quality data collected in 2009, except for the 1-hour SO_2 concentration. The 1-hour SO_2 concentration was from data collected in 2008.

7.5 Maximum impacts from the diesel engine generator show compliance with the state and federal ambient air quality standards. The modeling assessment for the 1,322 hp/1,000 kW diesel engine generator was based on operation at full capacity and 4,000 hr/yr operation.

AIR POLLUTANT	AVERAGING TIME	IMPACT (ug/m^3)[a]	BACKGROUND (ug/m^3)[a]	TOTAL IMPACT (ug/m^3)	AIR STANDARD (ug/m^3)	PERCENT STANDARD
SO_2	1-Hour	0.2	44.4	44.6	195.8	23
	3-Hour	0.2	39.2	39.4	1,300	3
	24-Hour	0.2	13.1	13.3	365	4
	Annual	0.04	5.2	5.2	80	7
NO_2	1-Hour	99.8	58.2	158.0	188	84
	Annual	15.1	7.5	22.6	70	32
CO	1-Hour	37.3	4,236.5	4,273.8	10,000	43
	8-Hour	19.9	1,374.0	1,393.9	5,000	28
PM_{10}	24-Hour	2.8	37.0	39.8	150	27
	Annual	0.7	16.0	16.7	50	33
$PM_{2.5}$	24-Hour	2.5	25.0	27.5	35	79
	Annual	0.8	5.5	6.3	15	42

8. Significant Permit Conditions

8.1 The total operating hours of the 1,100 TPH fixed plant shall be represented by the total combined operating hours of each diesel engine generator (1,322 hp/1,000 kW primary unit, 1,326/1,030 kW backup unit, and other temporary replacement units) powering the plant.

8.2 The total operating hours of the 800 TPH portable/fixed plant shall be represented by the total combined operating hours of each diesel engine generator (900 hp/701 kW primary unit and other temporary replacement units) powering the plant.

8.3 The total combined operating hours of the 1,322 hp/1,000 kW and 1,326 hp/1,030 kW diesel engine generators shall not exceed 4,000 hours in any rolling twelve-month (12-month) period.

8.4 The total operating hours of the 900 hp/701 kW diesel engine generator shall not exceed 2,950 hours in any rolling twelve-month (12-month) period.

Reason for 8.1 through 8.4: The applicant proposed to maintain 4,000 hours as the maximum operating hours per year for the fixed plant and 2,950 hours as the maximum operating hours per year for the portable/fixed plant to ensure the facility complies with the ambient air quality standards and to limit total emissions.

8.5 The 1,326 hp/1,030 kW backup diesel engine generator shall only be used as a replacement unit for the 1,322 hp diesel engine generator.

Reason for 8.5: If the old 1,326 hp/1,030 kW diesel engine generator is used as a backup for the old 900 hp/701 kW diesel engine generator, then there would be an increase in emissions because this would allow the 1,322 hp/1,000 kW and 1,326 hp/1,030 kW units to run simultaneously. The applicant proposed no increase in emissions for the modification to add the new 1,322 hp/1,000 kW diesel engine generator as the primary unit for powering the fixed plant.

8.6 The maximum number of diesel engine generators that may operate to power the crushing and screening facility is two (2). At no time shall more than two (2) diesel engine generators operate simultaneously.

Reason for 8.6: This condition was incorporated to ensure that there is no increase in emissions from the modification for operating a new diesel engine generator as a primary unit for the fixed plant in conjunction with an old backup unit for the fixed plant and old primary unit for the portable/fixed plant.

8.7 Incorporate minimum stack height requirements for the diesel engine generators.

Reason for 8.7: The modeling assessment was based on the stack heights reported by the applicant.

8.8 For any six (6) minute averaging period, the 1,322 hp/1,000 kW diesel engine generator shall not exhibit visible emissions of twenty (20) percent or greater, except as follows: during start-up, shutdown, or equipment breakdown, the 1,322 hp/1,000 kW diesel engine generator may exhibit visible emissions greater than twenty (20) but not exceeding sixty (60) percent opacity for a period aggregating not more than six (6) minutes in any sixty (60) minute period.

Reason for 8.8: Incorporate pursuant to HAR §11-60.1-32 (a) for sources manufactured after 1972.

8.9 For any six (6) minute averaging period, the 1,326 hp/1,030 kW and 900 hp/701 kW diesel engine generators shall not exhibit visible emissions of forty (40) percent or greater, except as follows: during start-up, shutdown, or equipment breakdown, the 1,326 hp/1,030 kW and 900 hp/701 kW diesel engine generators may exhibit visible emissions greater than forty (40) percent opacity, but not exceeding sixty (60) percent opacity, for a period aggregating not more than six (6) minutes in any sixty (60) minute period.

Reason for 8.9: Incorporate pursuant to HAR §11-60.1-32 (b) for sources manufactured before 1972.

8.10: Incorporate 40 CFR Part 60, Subpart OOO provisions for crushing and screening equipment. Requirements from Subpart OOO include the following:

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. For affected facilities other than crushers (e.g., screens and belt conveyors), the permittee shall not cause to be discharged into the atmosphere, fugitive emissions which exhibit greater than ten (10) percent opacity; and
c. If an affected facility (e.g., crusher, screen, and belt conveyor) is enclosed in a building, the permittee shall not cause to be discharged into the atmosphere, fugitive emissions from the building openings which exhibit greater than seven (7) percent opacity. For purposes of this condition, a building is any frame structure with a roof.

Reason for 8.10: Incorporate pursuant to Paragraphs 1.3, 1.9, and 2.2 of this permit application review.

8.11 Incorporate 40 CFR Part 60, Subpart IIII and 40 CFR Part 63, Subpart ZZZZ provisions for the new 1,322 hp/1,000 kW diesel engine generator. Pursuant to Subpart IIII and Subpart ZZZZ, the permit will specify that the 1,322 hp/1,000 kW diesel engine generator be fired only on fuel oil No. 2 with maximum sulfur content of 0.0015% by weight and minimum cetane index of forty (40) or maximum aromatic content of 35% by volume.

Reason for 8.11: Incorporate pursuant to Paragraphs 2.3 and 2.5 of this permit application review.

9. Conclusion and Recommendation:

9.1 Potential emissions from the crushing and screening facility are reduced with fuel sulfur content limits and hour per year operating restrictions specified in the permit. Fuel for the new kW diesel engine generator will be ultra low sulfur diesel which significantly reduces SO_2 emissions. The permit requires water spray systems to control particulate from the crushing and screening equipment. The permit also requires use of a water truck to control fugitive dust within the facility. The air modeling assessment for the new 1,322 hp/1,000 kW diesel engine generator demonstrated compliance with the ambient air quality standards. Recommend issuance of the covered source permit subject to the significant permit conditions and 45 day review by the Environmental Protection Agency.

Mike Madsen
March 31, 2011