

PROPOSED

PERMIT APPLICATION REVIEW TEMPORARY COVERED SOURCE PERMIT (CSP) NO. 0495-01-CT Renewal Application No. 0495-02

Applicant: R.H.S. Lee, Inc.
Facility: Mobile Jaw crushing plant
Location: Various Temporary Sites, State of Hawaii
Mailing Address: 96-1414 Waihona Place
Pearl City, Hawaii 96782

Equipment: The mobile jaw crushing plant consist of the following:

- a. 363-638 TPH "T" Series Extec Mega-Bite primary jaw crusher (28" x 44" jaw size);
- b. Hopper (approximately 9' x 14');
- c. Stepped vibrating grizzly feeder (approximately 4' x 13');
- d. Main conveyor;
- e. Hydraulic belt driven magnet;
- f. Side conveyor;
- g. Water spray system; and
- h. 300 hp Deutz diesel engine, model no. BS6M1015, serial no. 9133224.

Responsible

Official:	Mr. Richard Lee	Contact:	Mr. Scott Snider
Title:	President	Title:	Project Manager
Company:	R.H.S. Lee, Inc.	Company:	R.H.S. Lee, Inc.
Phone:	(808) 455-9026	Phone:	(808) 455-9026

1. Background

1.1 R.H.S. Lee, Inc. has submitted a temporary covered source permit renewal application for operating a 638 TPH mobile jaw crushing plant with 300 hp diesel engine. There are no changes proposed for the permit renewal that affect emissions. The only change proposed is to allow the replacement of the 300 hp diesel engine with a temporary replacement engine. The existing plant is subject to a 2,080 hour per year and 18 hour per day operating limit. The standard industrial classification code (SICC) for this facility is 1429 (Crushed and Broken Stone, Not Elsewhere Classified).

1.2 Pictures of the Extec jaw crushing plant are shown in Enclosure (1). Enclosure (1) pictures were taken during a February 21, 2007 site inspection at the R.H.S Lee, Inc. equipment yard in the Pearl City area.

2. Applicable Requirements

2.1 Hawaii Administrative Rules (HAR)
Title 11 Chapter 59, Ambient Air Quality Standards
Title 11 Chapter 60.1, Air Pollution Control

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- 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(27) Standards of Performance for Non-metallic 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 the this facility because the plant was manufactured after to1983 and the primary crusher for the plant has a capacity above 150 TPH.
- 2.3 The facility is not a major source for hazardous air pollutants (HAPs) and is not subject to National Emissions Standards for Hazardous Air Pollutants (NESHAPS) or Maximum Achievable Control Technology (MACT) requirements under 40 CFR, Parts 61 and 63.
- 2.4 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. CAM is not applicable because this facility is not a major source.
- 2.5 Prevention of Significant Deterioration (PSD) review applies to new major stationary sources and major modifications to these types of sources. The facility is not a major source for any air pollutant. As such, PSD review is not required.
- 2.6 Annual emissions reporting is required because this plant is a covered source.
- 2.7 The consolidate emissions reporting rule (CERR) does not apply because the facility does not exceed emission reporting levels pursuant to 40 CFR 51, Subpart A (see table below).

CERR APPLICABILITY			
Pollutant	Facility Emissions (2,080 hr/yr with water sprays and water truck)	CERR Triggering Levels (TPY)	
		1 year cycle (type A sources)	3 year cycle (type B sources)
PM ₁₀	10.3	≥ 250	≥ 100

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SO ₂	1.1	≥ 2,500	≥ 100
NO _x	9.3	≥ 2,500	≥ 100
VOC	0.7	≥ 250	≥ 100
CO	2.0	≥ 2,500	≥ 1,000

- 2.8 A best available control technology (BACT) analysis is not required because the plant is an existing source and there are no changes proposed for its operation. The table below shows potential emissions in comparison to the significant emission levels as defined in HAR, Section 11- 60.1.

BACT APPLICABILITY		
Pollutant	Emissions (TPY) ^a	Significant Level (TPY)
SO ₂	1.1	40
NO _x	9.3	40
CO	2.0	100
VOC	0.7	40
PM	32.1	25
PM ₁₀	10.3	15

^aBased on emissions from equipment added to the permit operated at 2,080 hr/yr with water a spray system and water truck to control fugitive dust.

- 2.9 The facility is a synthetic minor source because plant operation at 8,760 hours per year causes the facility to exceed major source thresholds for particulate.

3. Insignificant Activities

- 3.1 Insignificant activities identified by the application are listed below:

- a. 343 gallon hydraulic fluid tank servicing the 300 hp diesel engine is an insignificant activity in accordance with HAR §11-60.1-82(f)(1).
- b. 132 gallon fuel storage tank servicing the 300 hp diesel engine is an insignificant activity in accordance with HAR §11-60.1-82(f)(1).

4. Alternate Operating Scenarios

- 4.1 No alternate operating scenarios were proposed by the applicant.

5. Air Pollution Controls

- 5.1 The jaw crushing plant is equipped with a water spray system with water spray bars at discharge end of main conveyor and at jaw crusher.
- 5.2 A water spray truck is required to control fugitive dust at each work site for the crushing operations.

6. Project Emissions

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6.1 Emissions of NO_x, CO, VOC, PM, PM₁₀, and PM_{2.5}, and HAPs were evaluated from the 300 hp diesel engine. Emissions of NO_x, CO, VOC, and HAPs were based on emission factors from AP-42, Section 3.3 (10/96), Gasoline and Diesel Industrial Engines. Particulate matter emissions were based on manufacturer's information that the particulate matter emission rate is 0.15 g/hp-hr. A mass balance calculation was used to determine SO₂ emissions based on the maximum allowable fuel sulfur content of 0.5% by weight and a 14.8 gallon per hour maximum fuel consumption at 100% load. It was assumed that 96% of the total particulate was PM₁₀ 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. An operation limit of 2,080 hours per year was assumed for the diesel engine. Emission estimates are shown in Enclosure (2) and summarized below.

DIESEL ENGINE				
Pollutant	Engine Emission Rate		Engine Emissions (TPY)	
	lb/hr	g/s	2,080 hours	8,760 hours
SO ₂	1.050	0.133	1.1	4.6
NO _x	8.952	1.130	9.3	39.2
CO	1.929	0.243	2.0	8.4
VOC	-----	-----	0.7	2.9
PM	-----	-----	0.1	0.4
PM ₁₀	0.095	0.012	0.1	0.4
PM _{2.5}			0.1	0.4
HAPs			0.013	0.05

6.2 Particulate emissions from the crushing plant 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 PM₁₀ 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. A 70% control efficiency for water sprays was applied to determine emissions using the uncontrolled emission factors. A 2,080 hr/yr operation limit was also applied to determine emissions. The 638 TPH rated capacity of the jaw crushing plant was used to determine maximum potential emissions. Emissions are shown in Enclosure (3) and summarized below.

638 TPH JAW CRUSHING PLANT		
Pollutant	Emissions (TPY)	Total Plant Emissions (TPY)
	2,080 hr/yr with water sprays	8,760 hr/yr with water sprays
PM	1.7	8.0
PM ₁₀	0.9	4.3
PM _{2.5}	0.2	0.9

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 the plant's 638 TPH capacity and 2,080 hr/yr operation. The following were assumed for

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the emission factor equation: a 15 mph wind speed (highest value from range of wind speed specified in AP-42, Section 13.2.4), K value for PM₁₀ of 0.35, K value for PM of 0.74, K value for PM_{2.5} of 0.053, and a mean 0.7% moisture content for stone quarrying and processing. 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.

STORAGE PILES			
Pollutant	Emission Factor (lb/ton)	Emission Rate (TPY)	
		2,080 hr/yr with water truck	8,760 hr/yr with water truck
PM	0.043	8.6	36.0
PM ₁₀	0.020	4.0	16.8
PM _{2.5}	0.003	0.6	2.5

6.4 Emissions from vehicle travel on unpaved roads were calculated using the emission factor equation for vehicles traveling on unpaved surfaces. The equation was obtained from AP-42, Section 13.2.2 (11/06) 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 31,596 vehicle miles traveled per year for the 638 TPH plant based on 2,080 hr/yr operation, an average truck capacity of 21 tons (typical from other permit applications), and a 0.5 mile two way travel distance for the trucks (typical of other permit applications);
- b. A k value for PM, PM₁₀, and PM_{2.5} of 4.9, 1.5, and 0.15, respectively based on data for industrial roads;
- c. An a value for PM, PM₁₀, and PM_{2.5} of 0.7, 0.9, and 0.9, respectively based on data for industrial roads;
- d. A b value for PM, PM₁₀, and PM_{2.5} of 0.45 based on data for industrial roads;
- e. An s (silt content of road) value of 3.9% based on information from AP-42, Section 13.2.2 – Unpaved Roads Related Information
www.epa.gov/ttn/chief/ap42/ch13/related/c13s02-2.html;
- f. A W (mean vehicle weight) value of 26.5 tons (typical from other permit applications);
- g. A p (# of days with 0.01" of rain/year) value of 84 based on available data between years 1962 and 2006 from the Honolulu Observatory 702.2 recording climate parameters;
- h. A 70% control efficiency was applied to account for use of a water truck;
- i. Vehicle travel emissions are listed as follows:

VEHICLE TRAVEL			
Pollutant	Emission Factor (lb/VMT)	Emissions (TPY)	
		2,080 hr/yr with water truck	8,760 hr/yr with water truck
PM	5.953	21.7	91.4
PM ₁₀	1.122	5.3	22.3
PM _{2.5}	0.112	0.5	2.1

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6.5 Potential emissions from operating the jaw crushing plant are listed below as follows:

POTENTIAL EMISSIONS		
Pollutant	Potential Emissions (TPY) (2,080 hr/yr with water sprays and water truck)	Potential Emissions (TPY) (8,760 hr/yr with water sprays and water truck)
SO ₂	1.1	4.6
NO _x	9.3	39.2
CO	2.0	8.4
VOC	0.7	2.9
PM	32.1	135.8
PM ₁₀	10.3	43.8
PM _{2.5}	1.4	5.9
Total HAPs	0.013	0.050

7. Air Quality Assessment

7.1 An ambient air quality impact assessment (AAQIA) is not required for the 300 hp diesel engine because the engine is an existing source with no proposed modifications.

8. Significant Permit Conditions

8.1 The 638 TPH jaw crushing plant with 300 hp diesel engine shall not exceed 2,080 hours of operation in any rolling twelve (12) month period.

8.2 The 638 TPH jaw crushing plant with 300 hp diesel engine shall not exceed eighteen (18) hours of operation per day.

Reason for 8.1 and 8.2: The applicant proposed the hour limits in the initial permit application. The limits are necessary for compliance with the ambient air quality standards.

8.3 Incorporate minimum stack height requirement for the diesel engine.

Reason for 8.3: The AAQIA was based on stack height reported by applicant.

8.4: 40 CFR, Part 60, Subpart OOO provisions are applicable to the jaw crusher and conveyors built after 1983.

Reason for 8.4: Incorporated into the permit based on applicability to federal standards as indicated in Paragraph 2.2.

9. Conclusion and Recommendation:

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Actual emissions from this facility should be lower than estimated. Maximum potential emissions were based on worst-case conditions assuming maximum rated capacity of the diesel engine and jaw crushing plant. Actual crushing capacity will vary depending on product size and the type of material, but will likely be much lower than the maximum rated capacity. Calculations were based on 2,080 hours per year operation. The permit requires the use of a water spray system for compliance with the fugitive emission limits. The permit also requires the use of a water truck to control fugitive dust for plant operation. Recommend issuance of the temporary covered source permit renewal subject to the significant permit conditions, 30-day public comment period, and 45-day review by EPA.

Mike Madsen, August 10, 2007