

PROPOSED

TEMPORARY COVERED SOURCE APPLICATION REVIEW Permit Number: 0609-01-CT

Applicant: **Parsons Construction, Inc.**
Application No. 0609-01 New Application

Facility: **280 tph Terex Pegson Premiertrak Jaw Crusher
with 300 hp (224 kW) Caterpillar Diesel Engine (DE)**

Located At: Various Locations, State of Hawaii
Initial Location: Kualapa Loop Road Extension, Kaanapali, Maui

Universal Transverse Mercator (UTM) Coordinates:
Zone 4, 741,186 m E, 2,314,458 m N
North American Datum of 1983 (NAD 83):

Mailing Address: 294 Nakoa Place
Wailuku, Maui, HI 96793
Phone: (808) 244-5881

Standard Industrial Classification Code: 1429 Crushed and Broken Stone

Responsible Official: Joe Delmendo Phone: (808) 244-5881
Title: Project Manager
Address: 294 Nakoa Place
Wailuku, Maui 96793

Person To Contact: Richard Kellom Alexander Causey
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Equipment Description and Specifications

<u>Equipment</u>	<u>Description</u>
1. Jaw Crusher	280 tph Terex Pegson, model 26" x 44" Premiertrak, serial number QM 021 842, manufactured in Coalfield Leistershire, Great Britain in 2004.

This is a contained mobile tracked unit with hopper, two-way dirt chute, side conveyor, conveyor with hydraulic tail lift, magnetic separator, and dust suppression water sprays

PROPOSED

2. Diesel Engine 300 hp (224 kW) Caterpillar, model C9, serial number CLJ 03645, identification number PA9111-04, fuel oil no. 2, less than 0.5% sulfur by weight, at maximum consumption 15 gallons per hour. The diesel engine (DE) is on the jaw crusher.

The raw material consists of basalt and concrete. Rebar and other metals are removed by a built-in magnet. The raw material is dumped into the feeder by a front end loader. Undersized material falls through the feeder bars onto conveyor belt no. 1 to stockpile no. 1 beside crusher. The material caught by the feeder goes through the jaw crusher and onto conveyor belt no. 2 and stockpile no. 2.

Applicable Requirements

Hawaii Administrative Rules (HAR) Title 11

Chapter 11-59, Ambient Air Quality Standards

Chapter 11-60.1 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 New Source Performance Standards

Subchapter 9, Hazardous Air Pollutant Sources

Subchapter 10, Field Citations

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

Subpart A-General Provisions

Subpart OOO-Standards of Performance for Nonmetallic Mineral
Processing Plants

PROPOSED

Standards of Performance for New Stationary Sources [also known as New Source Performance Standards (NSPS)] is applicable. A portable crushed stone plant, that commences construction, reconstruction, or modification after August 31, 1983, with a capacity of 150 tons per hour or greater, is subject to the requirements of Title 40 Code of Federal Regulations (CFR) Part 60 Subpart OOO Standards of Performance for Nonmetallic Mineral Processing Plants. Fixed sand and stone plants with capacities of 25 tph or greater are subject to the same provisions. The maximum capacity of this jaw crusher is greater than 150 tph and was manufactured in 2004. All conditions as specified in Subpart OOO apply to this facility.

Synthetic Minor refers to sources which have the potential to emit greater than 100 ton per year of a regulated air pollutant, or 10 tons per hazardous air pollutant, or 25 tons per year for any combination of HAPs, but where limits are proposed to reduce emissions below these levels. A synthetic minor source is a potentially major source but is made a minor source through federally enforceable permit conditions, for example, limiting the facility's hours of operation, limiting the facility's fuel consumption, or the plant's material production throughput. Pollution control devices are considered as part of the facility. Based on the maximum potential of operations at 8,760 hours per year, and the limited hours of operation, this premiertrak jaw crusher is a synthetic minor.

Non-Applicable Requirements

Compliance Assurance Monitoring (CAM) Part 64 of the CFR for large emission or major sources that rely on air pollution control devices to achieve compliance. Applicability of the CAM Rule is determined on a pollutant specific basis for each affected emission unit. Each determination is based upon a series of evaluation criteria. In order for a source to be subject to CAM, each source must apply to all of the below:

1. Be located at a major stationary source per Title V of the Clean Air Act Amendments of 1990? Yes.
2. Be subject to federally enforceable applicable requirements. Yes.
3. Have pre-control device potential emissions that exceed applicable major source thresholds. Yes.
4. Be fitted with an "active" air pollution control device; No.
5. Not be subject to certain regulations that specifically exempt it from CAM. Yes.

Emission units are any part or activity of a stationary source that emits or has the potential to emit any air pollutant. This stone processing plant does not have any active pollution control devices except for their water spray system to minimize their fugitive emissions. Water sprinklers are not pollution control devices applicable to CAM. CAM is not applicable because this facility does not meet all of the above requirements.

PROPOSED

Consolidated Emission Reporting Rule (CERR) as defined by 40 CFR Part 51, Subpart A - Emissions Inventory Reporting Requirements, CERR is established to simplify reporting, offer options for data collection and exchange, and unify reporting dates for various categories of criteria pollutant emission inventory, for example, point, area, onroad, and nonroad mobile, and biogenics.

This rule applies to state and local agencies. CERR is based on facility-wide emissions for each air pollutant that emits at or exceeds the CERR and DOH triggering levels that are shown in the table below.

Pollutant	1-280 tph Stone Crushing Plant (tpy)	300 bhp Diesel Engine (tpy)	CERR Trigger Levels Annual Inventory Type A/B Point Source (tpy)	In-house Total Facility Trigger Levels (tpy)
NO _x	-	13.6	2,500 / 100	25
SO _x	-	0.9	2,500 / 100	25
CO	-	2.9	2,500 / 1000	250
PM ₁₀	5.4	1.0	250 / 100	25
PM _{2.5}	2.4 ²	0.9 ³	250 / 100	25
VOC	-	1.1	250 / 100	25
NH ₃ ¹	N/A	N/A	250 / 100	
Pb ¹	N/A	N/A	5	0.6

¹ NH₃ (ammonia) and Pb (lead) are not applicable.

² PM_{2.5} value, 15% of PM, referenced from AP-42; Appendix B.2; Table B.2.2; Category 3; Process: Mechanically Generated; Material: Mechanically Generated; For PM_{2.5} = TSP(16.2) x (0.15) = 2.43.

³ PM_{2.5} value, 90% of PM, referenced from AP-42; Appendix B.2; Table B.2.2; Category 1; Process: Stationary Internal Combustion Engines; Material: Gasoline and Diesel Fuel; For PM_{2.5} = TSP(1.0) x (0.90) = 0.90.

This facility does not have any individual emission points that emits at the CERR or in-house triggering levels. However, because this is a covered source, annual emissions reporting is required.

National Emission Standards for Hazardous Air Pollutants for Source Categories (NESHAPS): Pursuant to section 112 of the Clean Air Act (CAA), 40 CFR Part 61, §61.01(a) lists the substances which have been designated as HAPs. Under this part, NESHAPS is not applicable because there are no listed standards for crushers. Very little HAPs (0.02 tons per year) are being emitted from the fuel oil no. 2 burning diesel engine.

PROPOSED

Prevention of Significant Deterioration (PSD): 40 CFR Part 52, §52.21, PSD review applies to any state implementation plan 40 CFR, Part 52, to new major stationary sources and major modifications to these types of sources as listed and defined in HAR, Title 11, Chapter 11-60.1, Subchapter 7. This facility is not a major stationary source for any single air pollutant. Annual emissions of TSP with water sprays are calculated at less than 20 ton/year. Hence, PSD review is not required.

Best Available Control Technology (BACT) analysis applies to new and modified sources if the net increase in pollutant emissions exceed "significant levels" as defined in HAR §11-60.1-1 (considering any limitations, enforceable by the Department of Health, on the source to emit a pollutant). Also, for listed categories in CFR Parts 60, 61, and 63, BACT determination includes all fugitive emissions, except vehicle traffic emissions, which is included if the definition of "major" requires the consideration of fugitives in calculating potential emissions for major source determination.

BACT is an emissions limitation based on the maximum degree of reduction for each pollutant. On a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, if achievable through application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of the pollutant, the applicant eliminates or supports step-by-step pollution control options, beginning at the top of a list of best available pollution control technology, taking into account:

- (1) Energy;
- (2) Environmental; and
- (3) Economic impacts and other costs, if achievable through application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of the pollutant.

See Project Emissions in this review below, for emission calculations. The calculated potential maximum emissions for the Terex Pegson Premiertrak jaw crusher, does not exceed "significant level" of 25 tons of particulate matter of all sizes or 15 tons for particulate matter at 10 micrometers diameter and less. Therefore, a BACT analysis is not required for this facility.

Title 40 Code of Federal Regulations Part 63-National Emission Standards for Hazardous Air Pollutants for Source Categories Maximum Achievable Control Technology (MACT) means the maximum degree of reduction in emissions of the hazardous air pollutants (HAPs), on a case-by-case basis, taking into consideration the cost of achieving such emission reduction and any non-air quality health and environmental impacts and energy requirements, that is deemed achievable.

This source is not subject to MACT because there are no listed standards for jaw crushers.

Insignificant Activities/Exemptions

None mentioned.

Alternative Operating Scenarios

None proposed.

Project Emissions

The pollutant from the Terex Pegson Premiertrak jaw crusher is fugitive dust (PM or TSP). Emissions from the diesel fuel fired point source diesel engine are various criteria and hazardous air pollutants.

The criteria pollutants are total suspended particulates (TSP), particulate matter less 10 micrometers (PM₁₀), nitrogen oxide (NO_x), sulfur oxide (SO_x), carbon monoxide (CO), and total organic compounds (TOC).

The potential emissions are determined by use of the maximum capacity of the crusher which in this case is 280 tph. AP-42, 5th edition, Table 11.19.2-2 Emission Factors for Crushed Stone Processing Operations, August 2004, was used to calculate the fugitive dust emissions from the Terex Pegson Premiertrak jaw crusher. Because there were no primary and secondary crushing emission factors (EF), the tertiary crushing emission factor was used to predict crushing emissions. In this Premiertrak crusher, there is just one crusher. The "fines crushing" and "fines screening" are not applicable to this jaw crusher's operations.

AP-42 Table 3.3-1 Emission Factors For Uncontrolled Diesel Industrial Engines less than 600 hp, October 1996, was used to estimate the sulfur oxide (SO_x) and total organic compounds (TOC) emissions.

The emissions for nitrogen oxide (NO_x), carbon monoxide (CO), and particulate matter with less than 10 micrometers (PM₁₀) in units of pounds per hour were taken from the manufacturer Caterpillar's catalog "not to exceed data" submitted by the applicant.

Table 3.3-2 Speciated Organic Compound Emission Factors For Uncontrolled Diesel Engines, October 1996, were used to estimate the hazardous air pollutant emissions from the diesel engine.

Emissions were calculated with a maximum fuel consumption rate of 15.0 gallons per hour (gph), diesel fuel average heating value of 19,300 Btu/pound (Btu/lb), and 7.1 pounds per gallon density of fuel oil no 2, for the DE.

19,300 Btu/lb multiplied by 7.1 lb/gal equals 137,030 MMBtu/gal.

PROPOSED

UNCONTROLLED ESTIMATED EMISSIONS¹ OF CRITERIA AND HAZARDOUS AIR POLLUTANTS 280 tph TEREX PEGSON PREMIERTRAK JAW CRUSHER w/ 300 hp DIESEL ENGINE								
Pollutant and Description	300 hp Diesel Engine		Fugitive Dust Jaw Crusher		300 hp Diesel Engine		Fugitive Dust Jaw Crusher	
	3000 hr/yr		3000 hr/yr		8760 hr/yr		8760 hr/yr	
	lbs/hr	tons/yr	TSP ton/yr	PM ₁₀ tons/yr	lbs/hr	tons/yr	TSP tons/yr	PM ₁₀ tons/yr
TSP	0.13	0.22			0.13	0.63		
PM ₁₀	0.13	0.22			0.13	0.63		
CO	0.76	1.14			0.76	3.33		
NO _x	3.95	5.92			3.95	17.3		
SO _x	0.60	0.89			0.60	2.61		
TOC	0.74	1.11			0.74	3.24		
Benzene	0.00	0.003			0.00	0.008		
Toluene	0.00	0.001			0.00	0.004		
Xylenes	0.00	0.001			0.00	0.003		
Propylene	0.00	0.008			0.00	0.023		
1,3 Butadiene	0.000	0.0001			0.000	0.0004		
Formaldehyde	0.00	0.004			0.00	0.011		
Acetaldehyde	0.00	0.002			0.00	0.007		
Acrolein	0.000	0.0003			0.000	0.0008		
Naphthalene	0.000	0.0003			0.000	0.0008		
PAH ²	0.000	0.0005			0.000	0.002		
Pri Crusher			2.27	1.01		.	6.62	2.94
Sec Crusher			-	-			-	-
Tert Crusher			-	-			-	-
Fines Crushing			-	-			-	-
Screening			-	-			-	.

PROPOSED

Fines Screen			-	-			-	-	
Conveyor Transfer Pts			5.04 4 pts	1.85 4 pts			14.7 4 pts	4.42 4 pts	
Wet Drilling			-	-			-	-	
Truck Unload Fragmented			0.01	0.01			0.02	0.02	
Truck Unload Conveyor			0.04	0.04			0.12	0.12	
Unpaved Road ⁴			35.0	10.5			72.7	21.8	
Storage Piles ³			7.0	3.3			20.44	9.64	
Σ		HAPs 0.02	TSP 49.4	PM ₁₀ 16.7			HAPs 0.06	TSP 115	PM ₁₀ 38.9

¹ See individual calc sheets in file folder for calculations and specific data.

² PAH, polycyclic aromatic hydrocarbons

³ Emissions for storage piles were taken from the application. For 8760 emissions, 8760/3000 x application summary for 3000 hours of operation.

⁴ AP-42, 13.2.2, set at 1.7 miles (9,000 ft), 2.5 days per week for 3,000 hour year. Table 13.2.2-2,

PM₁₀ = (1.8/6) = 0.3 TSP = 0.3 x 35 = 10.5 tons.

Set at 1.7 miles (9,000 ft), 5 days per week for 8,760 hour year. PM₁₀ = (1.8/6) = 0.3 TSP = 0.3 x 72.7 = 21.8 tons

For fugitive emission calculations, 70% pollution control efficiency was used at water nozzle locations and throughout the stone processing line.

CONTROLLED ESTIMATED EMISSIONS¹ OF CRITERIA AIR POLLUTANTS 280 tph TEREX PEGSON PREMIERTRAK JAW CRUSHER				
Description	Fugitive Dust Stone Processing			
	3000 hr/yr		8760 hr/yr	
	TSP ton/yr	PM ₁₀ tons/yr	TSP tons/yr	PM ₁₀ tons/yr
Primary Crusher	0.68	0.30	1.99	0.88
Secondary Crusher	-	-	-	-
Terciary Crusher	-	-	-	-

PROPOSED

Fines Crushing	-	-	-	-
Screening	.	0.	.	.
Fines Screening	-	-	-	-
Conveyor Transfer Points 4	1.51	0.55	4.42	1.62
Wet Drilling Unfragmented	-	-	-	-
Truck Unloading Fragmented	0.00	0.00	0.01	0.01
Truck Unloading Conveyor	0.01	0.01	0.04	0.04
Unpaved Roads ³	11.9	3.57	21.8	6.54
Storage Piles ²	2.1	0.99	6.13	2.89
Totals	TSP 16.2	PM ₁₀ 5.4	TSP 34.4	PM ₁₀ 12.0

¹ See individual calc sheets in file folder for calculations and specific data.

² Storage Piles were taken from the application.

³ Unpaved Roads, AP-42, 13.2.2, set at 1.7 miles (9,000 ft), 2.5 days per week for 3,000 hour year. AP-42, Table 13.2.2-2, PM₁₀ = (1.8/6) = 0.3 TSP = 0.3x11.9 = 3.57 tons. Set at 1.7 miles (9,000 ft), 5 days per week for 8,760 hour year. PM₁₀ = (1.8/6) = 0.3 TSP = 0.3 x 21.8 = 6.54 tons.

Air Pollution Controls

The Terex Pegson Premiertrak jaw crusher has 3 sets of dust suppression water spray nozzles connected to the central manifold. A water truck is on site and is used to minimize fugitive dust on access roads and other areas around the plant.

The 300 hp diesel engine will be fired exclusively on fuel oil no. 2 with less than or equal to 0.5% sulfur content by weight to minimize sulfur dioxide emissions.

Air Quality Assessment

Ambient air means the general outdoor atmosphere to which the public has access. The numerical ambient air standards limit the time-average concentration of specified pollutants dispersed or suspended in the ambient air of the State, and these standards do not in any manner authorize the significant deterioration of existing air quality in any portion of the State.

PROPOSED

An ambient air quality impact analysis is performed for new or modified sources. The ambient air quality standards seek to protect public health and welfare and to prevent the significant deterioration of air quality.

The Department of Health air modeling guidance generally exempts an applicant from performing an ambient air quality impact analysis for:

- (1) existing sources with no proposed modifications,
- (2) insignificant activities,
- (3) fugitive emission sources (for example, storage tanks, storage piles, and pipe leaks), and
- (4) intermittent operating noncombustion sources.

This plant is a new source, therefore, the diesel engine's stack emissions of pollutant concentrations needs to be assessed to verify compliance with the ambient air quality standards.

AP-42 Table 3.3-1 Emission Factors For Uncontrolled Diesel Industrial Engines less than 600 hp, October 1996, were used to estimate the concentrations from the diesel engine for sulfur oxide (SO_x) and total organic compounds (TOC). The emission factors in units of pounds of pollutant per million Btu of fuel oil were converted to grams per second for modeling.

The emissions for nitrogen oxide (NO_x), carbon monoxide (CO), and particulate matter with less than 10 micrometers (PM₁₀) in units of pounds per hour were taken from the manufacturer Caterpillar's catalog "not to exceed data" submitted by the applicant, and converted into grams per second for modeling input.

CRITERIA POLLUTANT EMISSION RATE					
UNITS	NO _x	CO	SO _x	PM ₁₀	TOC
pound/MMBtu			0.29		0.36
pound/hour	3.95	0.76	0.60	0.13	0.74
gram/second	0.50	0.096	0.076	0.016	0.093

Conversion factors. Pounds to grams, multiply by 453.5924. Hours to seconds, multiply by 3600.

For NO_x = 3.95 lb/hr x 453.5924 g/lb / 3600 s/hr = 0.4977 g/s.

For SO_x = 0.29 lb/ MMBtu x 137,030 MMBtu/gal x 15 gal/hr / 1,000,000 = 0.596 lb/hr.

PROPOSED

The following table shows the results of the SCREEN3 modeling, consistent with 40 CFR Part 51, Appendix W, choosing simple terrain, with the dimensions of the jaw crusher as downwash wake structure. Screen3 default meteorology was used to predict ambient air impacts. See "Source Information" section in file folder for input and output text and results of Screen3, and the predicted maximum concentration of 491.7 micrograms per cubic meters ($\mu\text{g}/\text{m}^3$), at ground level 32 meters from stack.

The applicant proposed to limit to 3,000 hours per rolling twelve (12) month period.

300 hp CATERPILLAR DE STACK DATA					
Stack Ht	Stack Dir	Stack ID (INS DIA)	Exit V	Flow Rate Q	Stack Gas Exit Tmp
17' - 0" (5.18m)	up	5" (0.121m)	249 ft/s (76 m/s)	1852 ft ³ /min (0.874 m ³ /s)	793°F (696 °K)

COMPLIANCE WITH AMBIENT AIR QUALITY STANDARDS						
300 hp Caterpillar Diesel Engine						
AIR POLLUTANT	AVG'G TIME	PREDICTED AIR QUALITY IMPACTS ($\mu\text{g}/\text{m}^3$)			HAWAII AIR STANDARD ($\mu\text{g}/\text{m}^3$)	PERCENT OF STD (%)
		DEG	BCKGRD¹	TOTAL		
Carbon Monoxide CO	1-hour	49.2	2736	2,785	10,000	28
	8-hour	34.4	1496	1,530	5,000	31
Nitrogen Dioxide NO ₂	Annual	16.9	9	26	70	37
Particulate Matter PM ₁₀	24-hour	3.9	65	69	150	46
	Annual	0.7	19	20	50	40
Sulfur Dioxide SO ₂	3-hour	35.4	56	91	1,300	7
	24-hour	15.7	25	41	365	11
	Annual	2.7	1	4	80	5

¹ Background from 2004 Annual Summary Hawaii Air Quality Data.
CO Honolulu, Oahu; NO_x Kapolei, Oahu; PM₁₀ Kihei, Maui; and SO₂ Honolulu, Oahu

Other Issues

None.

Significant Permit Conditions

1. Subject to Title 40 Code of Federal Regulations (CFR) Part 60-Standards of Performance for New Stationary Sources, Subpart OOO.
2. A non-resetting hour meter shall be installed on the 300 bhp diesel engine for the recording of the 3,000 limiting hours of operation of the portable Terex Pegson Premiertrak jaw crusher.
3. The Terex Pegson Premiertrak jaw crusher shall be equipped with a water spray system to reduce emissions of fugitive dust. This water spray system shall be utilized as necessary while the plant is in operation.

Conclusion And Recommendation

Based on the information submitted by the applicant, it is the determination of the Hawaii Department of Health that the existing project will be in compliance with 40 CFR Part 60, Subpart A, Subpart OOO, and the Hawaii Administrative Rules (HAR), Chapter 11-60.1, and will not cause or contribute to a violation of any State or National ambient air quality standards.

Conservatism was applied to the estimated emissions from this facility. The actual crushing throughput will be much lower (basalt) than the assumed maximum design capacity used in the AP-42 emission calculations (limestone). Therefore, the Hawaii DOH intends to issue this CSP No. 0609-01-CT, subject to permit conditions, public comments, and EPA review.

Glenn Nagamine
December 2005