

PROPOSED

PERMIT APPLICATION REVIEW COVERED SOURCE PERMIT NO. 0773-01-C Application for Initial Permit No. 0773-01

Company: Waste Management of Hawaii, Inc.

Mailing Address: 92-460 Farrington Highway
Kapolei, Hawaii 96707

Facility: Waimanalo Gulch Sanitary Landfill
Crushing and Screening Plants

Location: 92-460 Farrington Highway
Kapolei, Hawaii 96707

SIC Code: 1429 (Crushed and Broken Stone, Not Elsewhere Classified)

Responsible Official: Mr. Joseph R. Whelan
General Manager/Vice President
(808) 668-2985

Contact: Mr. Justin Lottig
Environmental Protection Manager
(808) 668-1967

Equipment:

1. 440 TPH Nordberg mobile crushing plant, model no. LT105, serial no. TBD, with Caterpillar diesel engine (maximum 425 hp), model no. C-9, serial no. TBD;
2. 275 TPH Powerscreen screen, model no. Powergrid MK2, serial no. 7206775;
3. Powerscreen radial stacker, model no. M95;
4. Various conveyors; and
5. Water spray systems.

BACKGROUND

Waste Management of Hawaii, Inc. has submitted an application for an initial covered source permit to operate crushing and screening plants at its Waimanalo Gulch Sanitary Landfill facility. The 440 TPH Nordberg crushing plant will be powered by a Caterpillar C-9 Tier 3 diesel engine. The exact horsepower of the engine is not known because it has not yet been purchased. The application is based on a maximum 425 hp engine, which is the largest offered in the C-9 model. The applicant will be required to submit the exact size of the diesel engine before operation.

The total operating hours of the proposed crushing plant will be limited to 4,000 hours in any rolling twelve-month (12-month) period. There will be no operating hour limits for the screening plant. The screen and radial stacker are powered by exempt diesel engines. Water spray systems and water trucks will be used to control fugitive emissions.

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The crusher and screen will be used to process rock, dirt, soil or other similar material to be used for cover as needed throughout the landfill. The material is loaded into a hopper, crushed/screened, and conveyed to temporary storage piles. The material is then loaded onto trucks from the storage piles to provide cover at various locations throughout the facility.

APPLICABLE REQUIREMENTS

Hawaii Administrative Rules (HAR)

Title 11 Chapter 59, Ambient Air Quality Standards

Title 11 Chapter 60.1, Air Pollution Control

Subchapter 1, General Requirements

Subchapter 2, General Prohibitions

11-60.1-31, Applicability

11-60.1-32, Visible Emissions

11-60.1-33, Fugitive Dust

11-60.1-38, Sulfur Oxides from Fuel Combustion

Subchapter 5, Covered Sources

Subchapter 6, Fees for Covered Sources, Noncovered Sources, and Agricultural Burning

11-60.1-111, Definitions

11-60.1-112, General Fee Provisions for Covered sources

11-60.1-113, Application Fees for Covered sources

11-60.1-114, Annual Fees for Covered sources

11-60.1-115, Basis of 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

Standard of Performance for New Stationary Sources (NSPS), 40 CFR Part 60

Subpart OOO – Standards of Performance for Nonmetallic Mineral Processing Plants is applicable to the 440 TPH crushing plant (assumed constructed after April 22, 2008) and 275 TPH screening plant (constructed in 2005) because the maximum capacity of the facility is greater than 150 tons/hour, and the plants were manufactured after August 31, 1983.

Equipment that commence construction, modification, or reconstruction on or after April 22, 2008, have more stringent fugitive emission opacity limits.

Subpart IIII – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines is not applicable to the Caterpillar diesel engine because the engine is considered a nonroad engine as defined in 40 CFR §1068.30. Subpart IIII applies to stationary internal combustion engines that are not nonroad engines.

National Emission Standards for Hazardous Air Pollutants (NESHAP), 40 CFR Part 61

This source is not subject to NESHAP as there are no standards in 40 CFR Part 61 applicable to this facility.

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National Emission Standards for Hazardous Air Pollutants for Source Categories (NESHAP) (Maximum Achievable Control Technology (MACT)), 40 CFR Part 63

Subpart ZZZZ – National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (RICE) is not applicable to the Caterpillar diesel engine because the engine is considered a nonroad engine as defined in 40 CFR §1068.30. Subpart ZZZZ applies to stationary internal combustion engines that are not nonroad engines.

Prevention of Significant Deterioration (PSD), 40 CFR Part 52, §52.21

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

Compliance Assurance Monitoring (CAM), 40 CFR 64

This source is not subject to CAM because the facility is not a major source. The purpose of 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 pre-control emissions that are 100% of the major source level; and (5) not otherwise be exempt from CAM.

Consolidated Emissions Reporting Rule (CERR), 40 CFR Part 51, Subpart A

CERR is not applicable because emissions from the facility do not exceed CERR thresholds.

DOH In-house Annual Emissions Reporting

The Clean Air Branch requests annual emissions reporting from those facilities that have facility wide emissions exceeding in-house reporting levels and for all covered sources. Annual emissions reporting will be required because this facility is a covered source.

Best Available Control Technology (BACT)

This source is not subject to BACT analysis because potential emissions are below significant levels. BACT analysis is required for new sources or modifications to sources that have the potential to emit or increase emissions above significant levels considering any limitations as defined in HAR, §11-60.1-1.

Synthetic Minor Source

A synthetic minor source is a facility that is potentially major, as defined in HAR, §11-60.1-1, but is made non-major through federally enforceable permit conditions. This facility is not a synthetic minor source because potential emissions do not exceed major source thresholds when the facility is operated without limitations for 8,760 hours/year.

Greenhouse Gas Tailoring Rule

Title V permitting for greenhouse gas (GHG) emissions is not applicable because the potential to emit of CO₂ equivalent (CO₂e) emissions are less than 100,000 tons per year. Total GHG emissions on a CO₂e basis using the global warming potential (GWP) of the GHG are shown in the table below.

GHG	GWP	GHG Mass-Based Emissions (TPY)	CO ₂ e Based Emissions (TPY)
Carbon Dioxide (CO ₂)	1	976	976
Total Emissions:			976

INSIGNIFICANT ACTIVITIES / EXEMPTIONS

Diesel Engines

The following diesel engines are exempt in accordance with HAR §11-60.1-82(f)(2) because their heat input capacities are less than one MMBtu/hr. Based on the conversion factor from AP-42 (10/96) Table 3.3-1, note a:

1. 60 hp Deutz (screen): 60 hp x 7,000 Btu/hp-hr = 0.42 MMBtu/hr
2. 78 hp Deutz (radial stacker): 78 hp x 7,000 Btu/hp-hr = 0.55 MMBtu/hr

ALTERNATIVE OPERATING SCENARIOS

Diesel Engine

The permittee may replace the diesel engine with a temporary replacement unit of similar size with equal or lesser emissions if any repair reasonably warrants the removal of the diesel engine from its site (i.e., equipment failure, engine overhaul, or any major equipment problems requiring maintenance for efficient operation).

AIR POLLUTION CONTROLS

Water spray systems will be used as necessary to control fugitive emissions from crushing and screening operations. Water trucks/water sprays will be used as necessary to minimize fugitive dust from plant operations, material transfer points, stockpiles, and plant roads.

PROJECT EMISSIONS

Operating hours for the crushing plant will be limited to 4,000 hours in any rolling twelve-month (12-month) period. There will be no operating hour limits for the screening plant.

Crushing and Screening Plants

The maximum capacities of the crusher and screen were used to calculate emissions. Water sprays will be used to control PM emissions. Emissions were based on emission factors from AP-42 Section 11.19.2 (8/04) – Crushed Stone Processing and Pulverized Mineral Processing. Storage pile emissions were based on emission factors from AP-42 Section 13.2.4 (11/06) – Aggregate Handling and Storage Piles.

440 TPH Crushing Plant				
Pollutant	Crushing Plant Emissions (TPY)		Storage Piles Emissions (TPY)	
	4,000 hr/yr	8,760 hr/yr	4,000 hr/yr	8,760 hr/yr
PM	1.6	3.6	7.5	16.4
PM-10	0.7	1.5	3.5	7.8
PM-2.5	0.2	0.3	0.5	1.2

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275 TPH Screening Plant		
Pollutant	Screening Plant Emissions (TPY)	Storage Piles Emissions (TPY)
	8,760 hr/yr	8,760 hr/yr
PM	3.4	10.3
PM-10	1.2	4.9
PM-2.5	0.2	0.7

Caterpillar Diesel Engine

The diesel engine is fired on fuel oil no. 2 with a maximum sulfur content of 0.5% by weight. CO, NO_x, and PM emissions were based on EPA Tier 3 emission standards. The mass balance method was used to determine SO₂ emissions. VOC and HAP emissions were based on emission factors from AP-42 Section 3.3 (10/96) – Gasoline and Diesel Industrial Engines.

Caterpillar Diesel Engine			
Pollutant	Emissions (lb/hr)	Emissions (TPY) [4,000 hr/yr]	Emissions (TPY) [8,760 hr/yr]
CO	2.44	4.9	10.7
NO _x	2.81	5.6	12.3
SO ₂	1.51	3.0	6.6
PM	0.14	0.3	0.6
PM-10	0.14	0.3	0.6
PM-2.5	0.14	0.3	0.6
VOC	1.07	2.1	4.7
HAPs	0.011	0.02	0.05

Vehicle Travel on Unpaved Roads

The maximum capacity of the 440 TPH crushing plant was used to calculate emissions. A 70% control efficiency was assumed for water suppression to control fugitive dust. Emissions were based on emission factors from AP-42 Section 13.2.2 (11/06) – Unpaved Roads.

Vehicle Travel on Unpaved Roads		
Pollutant	Emissions (TPY) [4,000 hr/yr]	Emissions (TPY) [8,760 hr/yr]
PM	28.8	63.0
PM-10	7.8	17.0
PM-2.5	0.8	1.7

Total Emissions

Total facility emissions are summarized in the table below.

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Total Facility Emissions and Trigger Levels (TPY)					
Pollutant	Emissions (With Limits)	Emissions (No Limits)	BACT Significant Level	CERR Threshold	DOH Level
CO	4.9	10.7	100	1000	250
NO _x	5.6	12.3	40	100	25
SO ₂	3.0	6.6	40	100	25
PM	23.1 (51.8*)	34.2 (97.2*)	25	-	25
PM-10	10.6 (18.3*)	15.9 (32.9*)	15	100	25
PM-2.5	1.9 (2.6*)	3.0 (4.7*)	-	100	-
VOC	2.1	4.7	40	100	25
HAPs	0.02	0.05	-	-	5

* Including emissions from unpaved roads.

AIR QUALITY ASSESSMENT

An ambient air quality impact analysis (AAQIA) was conducted for the proposed Caterpillar diesel engine to demonstrate compliance with State and National ambient air quality standards. The AERMOD modeling system using Lakes Environmental AERMOD View, Version 8.0.7, was used for the modeling analysis.

Terrain

Terrain data from the USGS National Elevation Dataset. Resolution is 1/3 arc-second (about ten (10) meters).

Meteorological data

Meteorological data from Honolulu International Airport (2005 – 2009) was used for the analysis. Five (5) years of meteorological data was used for the 1-hr NO₂ and 1-hr SO₂ standards, and year 2009 data was used for the other standards.

Receptor Grid

Receptor grid spacing was set at thirty (30) meters.

Dispersion Coefficient

Rural dispersion coefficient was selected.

Building Downwash

EPA's Building Profile Input Program (BPIP-PRIME) was used to evaluate downwash effects of nearby structures.

Ozone Limiting Method

The ozone limiting method was used for the NO_x to NO₂ conversion. The in-stack NO₂/NO_x ratio of 20% for diesel engines was used for the model. The hourly ozone background concentrations obtained from the Sand Island, Oahu, air monitoring station for the years 2005 through 2009.

Emission Rates and Stack Parameters

The short term emission rates and stack parameters used in the analysis are shown in the table below.

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Source	Emission Rates (g/s)					Stack Parameters			
	CO	NO _x	PM-10	PM-2.5	SO ₂	Height (m)	Diameter (m)	Flow Rate (m ³ /s)	Temp (°K)
Caterpillar Engine	0.3069	0.3452	0.0177	0.0177	0.1899	4.27	0.152	0.94	755

Results

The annual concentrations assume an annual hourly limit of 4,000 hours/year for the diesel engine. The table below shows the predicted ambient air quality impacts from the diesel engine should comply with State and National ambient air quality standards.

Predicted Ambient Air Quality Impacts							
Air Pollutant	Averaging Time	Impact (µg/m ³)	Background ¹ (µg/m ³)	Total Impact (µg/m ³)	SAAQS (µg/m ³)	NAAQS (µg/m ³)	Compared to SAAQS
CO	1-hr	246.2	1374	1620.2	10000	40000	16.2%
	8-hr	123.4	1088	1211.4	5000	10000	24.2%
NO ₂	1-hr	125.0	47	172.0	-	188	91.5%
	Annual	10.8	5	15.8	70	100	22.6%
PM-10	24-hr	6.5	51	57.5	150	150	38.3%
	Annual	0.9	16	16.9	50	-	33.8%
PM-2.5	24-hr	6.5	21.2	27.7	-	35	79.2%
	Annual	0.9	5.3	6.2	-	15	41.3%
SO ₂	1-hr	137.4	50	187.4	-	196	95.6%
	3-hr	109.8	34	143.8	1300	1300	11.1%
	24-hr	69.9	9	78.9	365	365	21.6%
	Annual	9.6	4	13.6	80	80	17.0%

1. Background concentrations (2011 Hawaii Air Quality Data) from Kapolei.

SIGNIFICANT PERMIT CONDITIONS

- The rating of the Caterpillar diesel engine of the crushing plant shall not exceed 425 hp. Prior to operation of the Caterpillar diesel engine, the permittee shall submit to the Department of Health written documentation on the rating, model and serial numbers, and manufacturer's specification sheets.
- The total operating hours of the 440 TPH crushing plant, as represented by the total operating hours of the diesel engine, shall not exceed 4,000 hours in any rolling twelve-month (12-month) period.
- The diesel engine shall be fired only on fuel oil no. 2 with a maximum sulfur content not to exceed 0.5% by weight.

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4. 440 TPH Crushing Plant

- i. The permittee shall not cause to be discharged into the atmosphere from the crusher, fugitive emissions which exhibit greater than twelve (12) percent opacity.
- ii. The permittee shall not cause to be discharged into the atmosphere from any transfer point on the belt conveyors or from any other affected facility of the crushing plant, fugitive emissions which exhibit greater than seven (7) percent opacity.

5. 275 TPH Screening Plant

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

6. Incorporate other provisions of 40 CFR 60 Subpart OOO.

CONCLUSION

Waste Management of Hawaii, Inc. has submitted an application for a covered source permit to operate crushing and screening plants at its facility at Waimanalo Gulch Sanitary Landfill. Potential emissions were based on the maximum rated capacities of the equipment. Water sprays will be used to control fugitive emissions. The ambient air quality impact assessment of the Caterpillar diesel engine demonstrates compliance with State and National Ambient Air Quality Standards. Recommend issuance of the covered source permit subject to the incorporation of the significant permit conditions, thirty-day (30-day) public comment period, and forty-five-day (45-day) Environmental Protection Agency review period.

Mark Saewong
December 28, 2012