PROPOSED

PERMIT APPLICATION REVIEW
COVERED SOURCE PERMIT NO. 0653-02-C
Initial Application No. 0653-02

Company: Waste Management of Hawaii, Inc.

Mailing Address: P.O. Box 384419
Waikoloa, Hawaii 96738

Facility: West Hawaii Sanitary Landfill
Crushing and Screening Plants

Location: 71-1111 Queen Kaahumanu Highway
Waikoloa, Hawaii 96738

SIC Code: 4953 (Refuse Systems)

Responsible Official: Mr. Joseph R. Whelan
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Other Contact: Mike Kaha
Site Manager
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Equipment:

1. 340 TPH Extec crushing plant, model no. C-12, serial TBD, with:

    a. Caterpillar diesel engine (maximum 425 hp), model no. C9, serial no. TBD;
    b. Various conveyors; and
    c. Water spray system.

2. 275 TPH Extec screening plant, model no. 1999 Extec CE98, serial no. 5474, with:

    a. 111 hp Deutz diesel engine (exempt); and
    b. Various conveyors.

BACKGROUND

Waste Management of Hawaii, Inc. has submitted an application for an initial covered source permit to operate a 340 TPH crushing plant at its West Hawaii Sanitary Landfill facility. The facility currently operates a 275 TPH screening plant under noncovered source permit no. 0653-01-N. The screening plant will be permitted with the crushing plant under covered source permit no. 0653-02-C.

The crushing plant will be powered by a Caterpillar C-9 diesel engine. The maximum capacity of the crusher is assumed to be 340 TPH, based on a crusher with the same model number on permit no. 0633-02-CT. 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 when it is known.

The total operating hours of the proposed crushing and screening plants will be limited to 4,000 hours in any rolling twelve-month (12-month) period. The screen is powered by an exempt
111 hp diesel engine.

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

<u>Hawaii Administrative Rules (HAR)</u>
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 crushing plant (constructed after 2010) and screening plant (constructed in 2007) 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 diesel engines because the engines are considered nonroad engines as defined in 40 CFR §1068.30. Subpart IIII applies to stationary internal combustion engines that are not mobile/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.

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 diesel engines because the engines are considered nonroad engines as defined in 40 CFR §1068.30. Subpart ZZZZ applies to stationary internal combustion engines that are not mobile/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 triggering levels.

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 (excluding unpaved roads) 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 (excluding unpaved roads) do not exceed major source thresholds when the facility is operated without limitations for 8,760 hours/year.

INSIGNIFICANT ACTIVITIES / EXEMPTIONS

Diesel Engine
The 111 hp Deutz diesel engine powering the 275 TPH screen is considered an insignificant activity in accordance with HAR §11-60.1-82(f)(2) because the heat input capacity is less than one (1) MMbtu/hr. Based on the conversion factor from AP-42 (10/96) Table 3.3-1, note a:

111 hp x 7,000 Btu/hp-hr = 0.78 MMBtu/hr

ALTERNATIVE OPERATING SCENERIOS

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 sprays will be used as necessary to minimize fugitive emissions from crushing and screening operations, material transfer points, stockpiles, and plant roads. The crusher is equipment with a water spray system. Water trucks will be used to control fugitive dust associated with the on-site movement of trucks involved in material transfer.

PROJECT EMISSIONS

Operating hours for the crushing and screening plants will be limited to 4,000 hours in any rolling twelve-month (12-month) period.

340 TPH Crushing Plant
Emissions were based on the maximum capacity of the crusher. Water spray systems 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.

340 TPH Crushing Plant		
Pollutant	Emissions (TPY) [4,000 hr/yr]	Emissions (TPY) [8,760 hr/yr]
PM	1.12	2.46
PM-10	0.47	1.03
PM-2.5	0.10	0.21

Caterpillar Diesel Engine

The diesel engine is fired on fuel oil no. 2 with a maximum sulfur content of 0.5% by weight. Emissions were based on emission factors from AP-42 Section 3.3 (10/96) - Gasoline and Diesel Industrial Engines. The mass balance method was used to determine SO_2 emissions.

Caterpillar Diesel Engine			
Pollutant	Emissions (lb/hr)	Emissions (TPY) [4,000 hr/yr]	Emissions (TPY) [8,760 hr/yr]
CO	2.83	5.65	12.38
NO_X	13.12	26.24	57.46
SO_2	1.51	3.01	6.60
PM	0.92	1.84	4.04
PM-10	0.92	1.84	4.04
PM-2.5	0.92	1.84	4.04
TOC	1.07	2.14	4.69
HAPs	0.011	0.023	0.049

275 TPH Screening Plant

Emissions were based on emission factors from AP-42 Section 11.19.2 (8/04) - Crushed Stone Processing and Pulverized Mineral Processing.

275 TPH Screening Plant		
Pollutant	Emissions (TPY) [4,000 hr/yr]	Emissions (TPY) [8,760 hr/yr]
PM	18.72	40.99
PM-10	6.61	14.47
PM-2.5	2.81	6.15

Storage Piles

The maximum capacities of the crusher and screen were used to calculate emissions. Emissions were based on emission factors from AP-42 Section 13.2.4 (11/06) - Aggregate Handling and Storage Piles.

Storage Piles		
Pollutant	Emissions (TPY) [4,000 hr/yr]	Emissions (TPY) [8,760 hr/yr]
PM	0.65	1.43
PM-10	0.31	0.68
PM-2.5	0.05	0.10

Vehicle Travel on Unpaved Roads
The maximum capacities of the crusher and screen were 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	23.33	51.10
PM-10	5.70	12.49
PM-2.5	0.57	1.25

Total Emissions
Total facility emissions are summarized in the table below.

Total Facility Emissions and Trigger Levels (TPY)					
Pollutant	Emissions (Limited)	Emissions (No Limits 8,760 hr/yr)	BACT Significant Level	CERR Triggering Level (Type A sources / Type B sources)	DOH Level
CO	5.7	12.4	100	2,500 / 1000	250
NO_X	26.2	57.5	40	2,500 / 100	25
SO_2	3.0	6.6	40	2,500 / 100	25
PM	45.7 (22.3*)	100.0 (48.9*)	25	-	25
PM-10	14.9 (9.2*)	32.7 (20.2*)	15	250 / 100	25
PM-2.5	5.4 (4.8*)	11.8 (10.5*)	-	250 / 100	-
VOC	2.1	4.7	40	250 / 100	25
HAPs	0.02	0.05	-	-	5

* Excluding unpaved roads.

AIR QUALITY ASSESSMENT

An ambient air quality impact assessment (AAQIA) was conducted for the Caterpillar diesel engine to demonstrate compliance with State and National ambient air quality standards. The SCREEN3 screening model was used for the analysis to determine maximum pollutant impacts.

SCREEN3 Model Parameters
1. Unit emission rate of 1 g/s.
2. Ambient temperature of 293.15 °K.
3. Rural dispersion parameters.
4. Default meteorology.
5. Flat terrain.

Emission Rates and Stack Parameters
The short term emission rates and stack parameters used in the analysis are shown in the table below. The emission rates were adjusted to account for the 4,000 hours/year limit when modeling annual impacts.

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)
CAT engine	0.3561	1.6531	0.1162	0.1162	0.1889	4.27	0.05	0.913	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 ($\mu g/m^3$)	Background ($\mu g/m^3$)	Total Impact ($\mu g/m^3$)	SAAQS ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	Compared to SAAQS
CO	1-hr	40.2	4236.5	4276.7	10000	40000	42.8%
	8-hr	28.1	1374	1402.1	5000	10000	28.0%
NO_2	1-hr	129.6	48.9	178.5	-	188	95.0%
	Annual	17.0	7.5	24.5	70	100	35.1%
PM-10	24-hr	5.2	37	42.2	150	150	28.2%
	Annual	1.2	16	17.2	50	-	34.4%
PM-2.5	24-hr	5.2	14	19.2	-	35	55.0%
	Annual	1.2	5.5	6.7	-	15	44.7%
SO_2	1-hr	21.4	44.4	65.8	-	196	33.6%
	3-hr	19.3	26.1	45.4	1300	1300	3.5%
	24-hr	8.6	7.8	16.4	365	365	4.5%
	Annual	2.0	2.6	4.6	80	80	5.7%

notes:

1. EPA scaling factors of 0.9, 0.7, and 0.4 for the 3-hr, 8-hr, and 24-hr concentrations are used, respectively. State of Hawaii scaling factor of 0.2 is used for annual concentrations.
2. Background concentrations from 2009 Hawaii Air Quality Data. Background data collected from the Kona special purpose monitoring station was not used. Special purpose monitoring stations were established to monitor exceptional events such as volcanic eruptions.
   Maximum background concentrations from Kapolei, Oahu. Used 3-yr averages of the 98th percentile for 1-hr NO_2 and 24-hr PM-2.5. 1-hr SO_2 from 2008.
3. The ozone limiting method was used to calculate 1-hr NO_X to NO_2 conversion ($0.9NO_X > O_3$).
   1-hr NO_X model concentration = 186.6 $\mu g/m^3$
   1-hr O_3 background = 115.8 $\mu g/m^3$ (2008 Sand Island, Oahu)
   Assume 10% of NO_X discharged forms NO_2 and 90% forms NO
   $NO_2 = 0.1NO_X + (O_3 \text{ background})(MW\ NO_2/MW\ O_3)$
   $= 0.1(186.6\ \mu g/m^3) + (115.8\ \mu g/m^3)(46/48) = \underline{129.6\ \mu g/m^3}$

SIGNIFICANT PERMIT CONDITIONS

1. 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.

2. The total operating hours of the 340 TPH crushing plant, as represented by the total operating hours of the Caterpillar diesel engine, shall not exceed 4,000 hours in any rolling twelve-month (12-month) period.

3. The total operating hours of the 275 TPH screening plant, as represented by the total operating hours of its exempt diesel engine, shall not exceed 4,000 hours in any rolling twelve-month (12-month) period.

4. The Caterpillar diesel engine shall be fired only on fuel oil no. 2 with a maximum sulfur content not to exceed 0.5% by weight.

5. 340 TPH Crushing Plant

   a. The permittee shall not cause to be discharged into the atmosphere from the crusher, fugitive emissions which exhibit greater than twelve (12) percent opacity.
   b. 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.

6. 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.

CONCLUSION

Waste Management of Hawaii, Inc. submitted an application to operating crushing and screening plants. Based on the information submitted, it is the determination of the Department of Health that the proposed project will be in compliance with Hawaii Administrative Rules, Chapter 11-60.1, and State and National ambient air quality standards. Recommend issuance of the covered source permit subject to the incorporation of the significant permit conditions, 30-day public comment period, and 45-day Environmental Protection Agency review period.

Mark Saewong
March 3, 2011