Covered Source Permit No. 0406-01-CT

Application No.: Renewal application no. 0406-04
Minor modification application no. 0406-06

Organization Name: Maui Paving, LLC

Equipment Location: Various locations
Initial location identified as 26 Ulili Street, Kalamaula Industrial Park, Kaunakakai, Molokai

Responsible Official/Other Contact: Norman Shinno
Manager of Maui, Grace Pacific Corporation
P.O. Box 330838
Kahului, Hawaii 96733

SICC: 3531 Construction Machinery and Equipment

Proposed Project:

Maui Paving submitted application no. 0406-04 to renew the covered source permit for the 60 ton/hr portable asphalt drum mixer/dryer and 225 kW diesel engine generator. Application no. 0406-06 was submitted as a modification to replace the 225 kW diesel engine generator with a new 209 kW (prime rating) diesel engine generator. The existing diesel engine generator is subject to an operating limit of 4,000 hour per rolling twelve months. No limits are proposed for the new diesel engine generator. The drum mixer/dryer is subject to an existing operating limit of 10 hours per day which will remain unchanged in the permit.

The facility consists of aggregate stockpiles, a cold feed bin, portable asphalt drum mixer/dryer, oil burner, conveyors, silo for hot mix asphalt storage, a self erecting bin for loading and weighing asphalt, and a diesel engine generator. Stockpiles at the site supply aggregate for the mix. A front end loader batch-drops the aggregate into a cold feed bin which in turn releases the material onto a conveyor belt feeding the portable drum dryer/mixer. The aggregate is heated to a temperature of approximately 300°F in the drum dryer/mixer for drying. Preheated liquid asphalt is added to the aggregate in quantities of five (5) to seven (7) percent the weight of the aggregate and the material is mixed to create a uniform product. The final product is transported by conveyor belt to a forty (40) ton storage silo that deposits the mix into trucks for delivery off site. The diesel engine generator is the only source of power for the plant.

Equipment Description:

Equipment Description	Capacity	Fuel Usage
Asphalt Drum Mixers, Inc. drum mixer/dryer model no. SPL-5424, serial no. SPL5424238-91	60 tons/hr	
Hauck burner	23 MMBtu/hr	164 gallons/hr fuel oil no. 2
Cummins 230DSHAD diesel engine generator	209 kW (prime rating), 60 Hz	17 gallons/hr fuel oil no. 2
Storage silo	40 tons	n/a
Aggregate storage piles	n/a	n/a
Conveyors	n/a	n/a

Air Pollution Control:

The drum mixer/dryer is equipped with a variable throat, venturi style wet scrubber for the control of particulate matter. A water truck is used as necessary to control fugitive dust emissions from vehicle traffic on unpaved roads.

Applicable Requirements:

Applicable Hawaii Administrative Rules (HAR):

Chapter 11-59, Ambient Air Quality Standards
Chapter 11-60.1
- Subchapter 1, General Requirements
- Subchapter 2, General Prohibitions
  - 11-60.1-31 Applicability
  - 11-60.1-32 Visible Emissions
  - 11-60.1-33 Fugitive Emissions
  - 11-60.1-37 Process Industries
  - 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
    - (9) Subpart I, Standards of Performance for Asphalt Concrete Plants
- Subchapter 9, Hazardous Air Pollutant Sources
- Subchapter 10, Field Citations

Annual Emissions Reporting Requirements

As a covered source the facility is subject to the requirements of annual emissions reporting.

NSPS Applicability

The asphalt plant is subject to 40 CFR Part 60, Subpart I - Standards of Performance for Hot Mix Asphalt Facilities which applies to each hot mix asphalt facility comprised only of any combination of the following: dryers; systems for screening, handling, storing, and weighing hot aggregate; systems for loading, transferring, and storing mineral filler, systems for mixing hot mix asphalt; and the loading, transfer, and storage systems associated with emission control systems, that commences construction or modification after June 11, 1973.

The asphalt plant is subject to the NSPS because it is a hot mix asphalt facility that was constructed after June 11, 1973.

The diesel engine generator is subject to 40 CFR Part 60, Subpart IIII Standards of Performance for Stationary Compression Ignition Internal Combustion Engines (CI ICE). The unit meets the applicability trigger of owners and operators of stationary CI ICE that commence

construction after July 11, 2005 where the stationary CI ICE are manufactured after April 1, 2006 and are not fire pump engines. The date that construction commences is the date the engine is ordered by the owner or operator.

The unit is also subject to 40 CFR Part 63 Subpart ZZZZ National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (RICE). The diesel engine generator is a new stationary RICE located at an area source of HAPs that is required to meet the requirements of Subpart ZZZZ by meeting the requirements of Subpart IIII. No other requirements in Subpart ZZZZ apply.

Non-Applicable Requirements:

PSD Applicability

The facility is not subject to PSD review because it is an existing minor source facility whose maximum potential emissions following the modification are below major source levels.

Part 51, Subpart A, Emission Inventory Reporting Requirements – Consolidated Emissions Reporting Rule (CERR)

40 CFR Part 51, Subpart A, Emission Inventory Reporting Requirements, determines the applicability of compliance emissions reporting based on the emissions of each air pollutant from the facility.

Minimum Point Source Reporting Thresholds by Pollutant			
Pollutant	Annual Cycle type A sources	Three-year cycle type B sources	Facility Emissions [a]
	tons/year	tons/year	tons/year
SO_x	≥ 2500	≥ 100	1.73
VOC	≥ 250	≥ 100	4.35
NO_x	≥ 2500	≥ 100	17.32
CO	≥ 2500	≥1000	15.19
Pb		≥ 5	1.64E-03
PM_{10}	≥ 250	≥ 100	4.56
$PM_{2.5}$[a]	≥ 250	≥ 100	3.17
Ammonia	≥ 250	≥ 100	not anticipated

[a] Based on drum mixer/dryer operating limit of 10 hours per day.

The facility is not subject to CERR requirements.

BACT Applicability

New or modified sources are subjected to a Best Available Control Technology (BACT) analysis if a net increase in pollutant emissions exceeds the "significant" levels defined by HAR 11-60.1-1. The following table compares emissions from the project to significant levels.

Comparison of Facility Emissions to Significant Levels			
pollutant	facility emissions [a]	significant level	facility emissions exceeds significant levels?
	tons/year	tons/year	
Nitrogen Oxides	17.32	40	no
Sulfur Dioxide	1.73	40	no
Carbon Monoxide	15.19	100	no
Volatile Organic Compounds	4.35	40	no
Particulate Matter - TSP	7.13	25	no
Particulate Matter - PM10	4.56	15	no
Lead	1.64E-03	6.00E-01	no
Sulfuric Acid Mist	not anticipated	7	---
Beryllium	not anticipated	4.00E-04	---
Mercury	2.85E-04	1.00E-01	no
Fluorides	not anticipated	3	---
Arsenic	6.13E-05	any amount	yes
Benzene	5.24E-02	any amount	yes

[a] Detailed emission calculations are in the **Project Emissions** section.

Facility emissions are based on operation of the 209 kW diesel engine generator for 8,760 hours per year and the 60 ton per hour drum mixer/dryer a maximum of 10 hours per day (3,650 hours per year). Facility emissions take into consideration controls by the venturi style wet scrubber and water truck.

NESHAP Applicability

The diesel engine generator is not subject to any applicable standard under 40 CFR Part 61.

Compliance Assurance Monitoring Applicability

40 CFR Part 64 Compliance Assurance Monitoring (CAM) rule. The facility is not subject to the CAM rule since it is not a major source of emissions.

Synthetic Minor Status

A synthetic minor 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 based on total emissions below major source levels when calculated at 8,760 hours per year for the asphalt plant and diesel engine generator.

Alternate Operating Scenarios:

The applicant is proposing the use of a temporary replacement diesel engine generator in the event the permitted diesel engine generator requires off-site repair or maintenance. The replacement unit must be of the same size or smaller with equal or less emissions and must comply with all applicable requirements.

Insignificant Activities:

- Diesel storage tanks – The facility has a 4,400 gallon and a 3,000 gallon above ground storage tank that are considered an insignificant activity per HAR § 11-60.1-82(f)(1).
- Propane tank – The facility has a 58 gallon propane tank that is insignificant pursuant to HAR § 11-60.1-82(f)(1).
- Gasoline storage tank – The facility has one 950 gallon above ground storage tank for gasoline that is insignificant pursuant to HAR § 11-60.1-82(f)(1).
- 65 ton ASTEC, Inc. Turbo Six Pack Self Erecting Bin used to load and weigh hot mix asphalt.
- Asphalt cement heated tank – The asphalt heater is Model HSPO-15P, is fired on 5.7 gallons/hour of fuel oil no. 2 maximum and has a heat input capacity of 0.78 MMBtu/hour. The asphalt heater is exempt per HAR § 11-60.1(f)(2).

Asphalt Heater
Criteria Pollutant Emissions

pollutant	emission factor[a]	emission rate	emission rate	emission rate at 8,760 hours/yr
	lb/gal	lb/hr	g/sec	tons/yr
CO	0.0012	6.84E-03	8.62E-04	3.00E-02

[a] Emission factor from AP-42 Table 11.1-13 (3/04).

Asphalt Heater
Hazardous Air Pollutant Emissions

pollutant	emission factor[a]	emission rate	emission rate	emission rate at 8,760 hours/yr
	lb/gal	lb/hr	g/sec	tons/yr
Formaldehyde	3.50E-06	2.00E-05	2.51E-06	8.74E-05
Acenaphthene	5.3E-07	3.02E-06	3.81E-07	1.32E-05
Acenaphthylene	2.00E-07	1.14E-06	1.44E-07	4.99E-06
Anthracene	1.80E-07	1.03E-06	1.29E-07	4.49E-06
Benzo(b)fluoranthene	1.00E-07	5.70E-07	7.18E-08	2.50E-06
Fluoranthene	4.40E-08	2.51E-07	3.16E-08	1.10E-06
Fluorene	3.20E-08	1.82E-07	2.30E-08	7.99E-07
Naphthalene	1.70E-05	9.69E-05	1.22E-05	4.24E-04
Phenanthrene	4.90E-06	2.79E-05	3.52E-06	1.22E-04
Pyrene	3.20E-08	1.82E-07	2.30E-08	7.99E-07
1,2,3,7,8,9-HxCDD	7.60E-13	4.33E-12	5.46E-13	1.90E-11
1,2,3,4,7,8-HxCDD	6.90E-13	3.93E-12	4.96E-13	1.72E-11
HxCDD	6.20E-12	3.53E-11	4.45E-12	1.55E-10
1,2,3,4,6,7,8-HpCDD	1.50E-11	8.55E-11	1.08E-11	3.74E-10
HpCDD	2.00E-11	1.14E-10	1.44E-11	4.99E-10
OCDD	1.60E-10	9.12E-10	1.15E-10	3.99E-09
TCDF	3.30E-12	1.88E-11	2.37E-12	8.24E-11
PeCDF	4.80E-13	2.74E-12	3.45E-13	1.20E-11
HxCDF	2.00E-12	1.14E-11	1.44E-12	4.99E-11
HpCDF	9.70E-12	5.53E-11	6.97E-12	2.42E-10
1,2,3,4,6,7,8-HpCDF	3.50E-12	2.00E-11	2.51E-12	8.74E-11
OCDF	1.20E-11	6.84E-11	8.62E-12	3.00E-10
Total HAPs				6.62E-04

[a] Emission factor from AP-42 Table 11.1-13 (3/04).

Facility emissions are below major source levels when taking into consideration both permitted and insignificant activities. This is based on operation of the diesel engine generator for 8,760 hours per year and the drum mixer/dryer for 10 hours per day, 365 days per year.

Project Emissions:

209 kW (Prime Rating) Diesel Engine Generator
Criteria Pollutant Emissions

pollutant	HP-hour rating (full prime rating)	emission rate [a]	emission rate	emission rate	emission rate	emission rate
		grams/HP-hour	grams/hour	grams/sec	lbs/hr	tons/yr
NO_x	325	3.6	1170	0.325	2.58	**11.30**
CO	325	0.27	87.75	0.024	0.19	**0.85**
PM	325	0.05	16.25	0.005	0.04	**0.16**
PM_{10}	325	0.048	15.60	0.004	0.03	**0.15**
$PM_{2.5}$	325	0.046	14.79	0.004	0.03	**0.14**
SO_2	325	---	---	0.015	0.12	**0.52**
HC	325	0.05	16.25	0.005	0.04	**0.16**

[a] Emission rates are from the manufacturer's (Cummins) Exhaust Emission Data Sheet for the diesel engine generator at Full Prime Load. Emission levels are rated as EPA Nonroad Tier 3. PM_{10} and $PM_{2.5}$ emission factors are based on AP-42 Appendix B.2 Particle Size Distributions, Table B.2-2 Description of Particle Size Categories. The SO_2 lb/hr emission rate is based on a mass balance calculation with the maximum fuel sulfur content of 0.05% by weight.

17 gal/hr x 7.05 lb fuel/gal x 0.05% sulfur by weight x 2 (the ratio of SO_2/S) = 0.1199 lb SO_2/hr.

209 kW (Prime Rating) Diesel Engine Generator
Hazardous Air Pollutant Emissions

pollutant	emission factor [a]	fuel consumption	MMBtu/hr rating	emission rate	emission rate
	lb/MMBtu	gal/hr		lb/hr	tons/yr
Benzene	9.33E-04	17	2.38	2.22E-03	9.73E-03
Toluene	4.09E-04	17	2.38	9.73E-04	4.26E-03
Xylenes	2.85E-04	17	2.38	6.78E-04	2.97E-03
Propylene	not a HAP				
1,3-Butadiene	3.91E-05	17	2.38	9.31E-05	4.08E-04
Formaldehyde	1.18E-03	17	2.38	2.81E-03	1.23E-02
Acetaldehyde	7.67E-04	17	2.38	1.83E-03	8.00E-03
Acrolein	9.25E-05	17	2.38	2.20E-04	9.64E-04
PAH	1.68E-04	17	2.38	4.00E-04	1.75E-03
total HAPs	3.87E-03			**9.22E-03**	**4.04E-02**

[a] Emission factor from AP-42 Table 3.3-2 Speciated Organic Compound Emission Factors for Uncontrolled Diesel Engines (10/96).

60 TPH Drum Mix Hot Mix Asphalt Plant
Dryer Emissions
Criteria Pollutant Emissions

pollutant	emission factor [a]	emission rate	emission rate	emission rate at 8,760 hours/yr	emission rate with 10 hr/day operating limit
	lb/ton	lb/hr	g/sec	tons/yr	tons/yr
PM	0.026	1.56	1.97E-01	**6.83**	**2.85**
PM_{10}	0.026	1.56	1.97E-01	**6.83**	**2.85**
$PM_{2.5}$	0.026	1.56	1.97E-01	**6.83**	**2.85**
CO	0.130	7.8	9.83E-01	**34.16**	**14.24**
NO_x	0.055	3.3	4.16E-01	**14.45**	**6.02**
SO_2	0.011	0.66	8.32E-02	**2.89**	**1.20**
VOC	0.032	1.92	2.42E-01	**8.41**	**3.50**

[a] Emission factors from AP-42 Tables 11.1-3, 11.1-7, and 11.1-8 (3/04).

60 TPH Drum Mix Hot Mix Asphalt Plant Dryer
Hazardous Air Pollutant Emissions

pollutant	emission factor [a]	emission rate	emission rate	emission rate at 8,760 hours/yr	emission rate with 10 hr/day limit
	lb/ton	lb/hr	g/sec	tons/yr	tons/yr
Benzene	3.90E-04	2.34E-02	2.95E-03	1.02E-01	4.27E-02
Ethylbenzene	2.40E-04	1.44E-02	1.81E-03	6.31E-02	2.63E-02
Formaldehyde	3.10E-03	1.86E-01	2.34E-02	8.15E-01	3.39E-01
Hexane	9.20E-04	5.52E-02	6.96E-03	2.42E-01	1.01E-01
Methyl chloroform	4.80E-05	2.88E-03	3.63E-04	1.26E-02	5.26E-03
Toluene	2.90E-03	1.74E-01	2.19E-02	7.62E-01	3.18E-01
Xylene	2.00E-04	1.20E-02	1.51E-03	5.26E-02	2.19E-02
total PAHs	8.80E-04	5.28E-02	6.65E-03	2.31E-01	9.64E-02
Arsenic	5.60E-07	3.36E-05	4.23E-06	1.47E-04	6.13E-05
Beryllium	0.00	0.00	0.00	0.00	0.00
Cadmium	4.10E-07	2.46E-05	3.10E-06	1.08E-04	4.49E-05
Chromium	5.50E-06	3.30E-04	4.16E-05	1.45E-03	6.02E-04
Cobalt	2.60E-08	1.56E-06	1.97E-07	6.83E-06	2.85E-06
Hexavalent Chromium	4.50E-07	2.70E-05	3.40E-06	1.18E-04	4.93E-05
Lead	1.50E-05	9.00E-04	1.13E-04	3.94E-03	1.64E-03
Manganese	7.70E-06	4.62E-04	5.82E-05	2.02E-03	8.43E-04
Mercury	2.60E-06	1.56E-04	1.97E-05	6.83E-04	2.85E-04
Nickel	6.30E-05	3.78E-03	4.76E-04	1.66E-02	6.90E-03
Phosphorus	2.80E-05	1.68E-03	2.12E-04	7.36E-03	3.07E-03
Selenium	3.50E-07	2.10E-05	2.65E-06	9.20E-05	3.83E-05
total HAPs				**2.31**	**9.64E-01**

[a] Emission factors from AP-42 Tables 11.1-10 and 11.1-12 (3/04).

Miscellaneous Aggregate and Vehicle Traffic Emissions

PM

activity	maximum throughput	PM emission factor	PM emission rate	PM emission rate for 8,760 hrs/yr	PM emission rate with 10 hr/day limit
	tph	lb/ton	lb/hr	tons/yr	tons/yr
Truck Loading Aggregate to Bin [a]	60	ND	ND	ND	ND
Active Storage Piles [b]	60	7.23E-03	4.34E-01	1.90	0.79
Conveyor Transfer Points [c] (6 each)	60	3.00E-03	1.08	4.73	1.97
Vehicle traffic on unpaved roads [d]	0.284 VMT/hr	2.48 lb/VMT	0.70	3.08	1.28
Total				**9.71**	**4.05**

PM_{10}

activity	maximum throughput	PM_{10} emission factor	PM_{10} emission rate	PM_{10} emission rate for 8,760 hrs/yr	PM_{10} emission rate with 10 hr/day limit
	tph	lb/ton	lb/hr	tons/yr	tons/yr
Truck Loading Aggregate to Bin [a]	60	1.60E-05	9.60E-04	4.20E-03	1.75E-03
Active Storage Piles [b]	60	3.42E-03	2.05E-01	8.98E-01	3.74E-01
Conveyor Transfer Points [c] (6 each)	60	1.10E-03	3.96E-01	1.73	0.72
Vehicle traffic on unpaved roads [d]	0.284 VMT/hr	7.31E-01 lb/VMT	2.08E-01	0.91	0.38
Total				**3.55**	**1.48**

$PM_{2.5}$

activity	maximum throughput	$PM_{2.5}$ emission factor	$PM_{2.5}$ emission factor	$PM_{2.5}$ emission factor for 8,760 hrs/yr	$PM_{2.5}$ emission factor with 10 hr/day limit
	tph	lb/ton	lb/hr	tons/yr	tons/yr
Truck Loading Aggregate to Bin [a]	60	ND	ND	ND	ND
Active Storage Piles [b]	60	5.18E-04	3.11E-02	1.36E-01	5.67E-02
Conveyor Transfer Points [c] (6 each)	60	ND	ND	ND	ND
Vehicle traffic on unpaved roads [d]	0.284 VMT/hr	7.31E-02 lb/VMT	2.08E-02	9.10E-02	3.79E-02
Total				**2.27E-01**	**9.46E-02**

[a] PM, PM_{10}, and $PM_{2.5}$ emission factors for Truck Loading Aggregate to Bin are based on AP-42 Table 11.19.2-2 for Truck Unloading – Fragmented Stone (8/04).
[b] PM, PM_{10}, and $PM_{2.5}$ emission factors for Active Storage Piles are based on AP-42 Section 13.2.4 Aggregate Handling and Storage Piles equation (1), (11/06):

(1) $E = k(0.0032)[(U/5)^{1.3}/(M/2)^{1.4}]$

	<30	<10	<2.5
k particle size multiplier, dimensionless	0.74	0.35	0.053
U mean wind speed, mph	15	15	15
M material moisture content, %	2.5	2.5	2.5
E emission factor, lb/ton	7.23E-03	3.42E-03	5.18E-04

[c] PM, PM_{10}, and $PM_{2.5}$ emission factors for Conveyor Transfer Points are based on AP-42 Table 11.19.2-2 for Conveyor Transfer Point (8/04).

[d] PM, PM_{10}, and $PM_{2.5}$ emission factors are based on AP-42 Section 13.2.2 Unpaved Roads equations (1a) and (2), (11/06):

(1a) $E = k(s/12)^a(W/3)^b$

	<30	<10	<2.5
k empirical constant	4.9	1.5	0.15
s surface material silt content, %	10	10	10
W mean vehicle weight, tons	27	27	27
a empirical constant	0.7	0.9	0.9
b empirical constant	0.45	0.45	0.45
E emission factor, lb/VMT	11.59	3.42	0.34

(2) $E_{ext} = E[(365-P)/365]$

	<30	<10	<2.5
E emission factor from 1a	11.59	3.42	0.34
P number days in a year with at least 0.01 in precipitation (Molokai Airport 1957 – 2004)	105	105	105
E_{ext} emission factor extrapolated, lb/VMT	8.26	2.44	0.24
Control through water truck, %	70	70	70
E_{ext} controlled, lb/VMT	2.48	0.73	0.07

Vehicle Traffic on Unpaved Roads, maximum throughput, is based on:

AC production = 60 tons/hr
Truck capacity = 24 tons/truck
Truck load out rate = 2.5 trucks/hour
Vehicle Miles Traveled (VMT) per truck load = 0.1136 VMT/truck
VMT per hour = 0.284 VMT/hour

Drum Mix Plant Load Out and Silo Filling Emissions
Criteria Pollutant Emissions

activity	pollutant	EF	emission rate	emission rate 8,760 hrs/yr	emission rate with 10 hr/day limit
		lb/ton	lb/hr	tons/yr	tons/yr
drum mix plant load out	PM [a]	3.13E-04	1.88E-02	8.23E-02	3.43E-02
	Organic PM [b]	1.32E-04	7.94E-03	3.48E-02	1.45E-02
	TOC [c]	1.61E-03	9.69E-02	4.24E-01	1.77E-01
	CO [d]	5.24E-04	3.14E-02	1.38E-01	5.73E-02
silo filling	PM [e]	4.31E-04	2.58E-02	1.13E-01	4.71E-02
	Organic PM [f]	9.86E-05	5.91E-03	2.59E-02	1.08E-02
	TOC [g]	4.73E-03	2.84E-01	1.24E+00	5.18E-01
	CO [h]	4.58E-04	2.75E-02	1.20E-01	5.02E-02
total	**PM**	7.44E-04	4.46E-02	1.95E-01	**8.15E-02**
	Organic PM	2.31E-04	1.39E-02	6.07E-02	2.53E-02
	TOC	6.34E-03	3.81E-01	1.67E+00	6.95E-01
	CO	9.82E-04	5.89E-02	2.58E-01	**1.08E-01**

a $EF = 0.000181 + 0.00141(-V)e^{((0.0251)(T + 460) - 20.43)}$
b $EF = 0.00141(-V)e^{((0.0251)(T + 460) - 20.43)}$
c $EF = 0.0172(-V)e^{((0.0251)(T + 460) - 20.43)}$
d $EF = 0.00558(-V)e^{((0.0251)(T + 460) - 20.43)}$
e $EF = 0.000332 + 0.00105(-V)e^{((0.0251)(T + 460) - 20.43)}$
f $EF = 0.00105(-V)e^{((0.0251)(T + 460) - 20.43)}$
g $EF = 0.0504(-V)e^{((0.0251)(T + 460) - 20.43)}$
h $EF = 0.00488(-V)e^{((0.0251)(T + 460) - 20.43)}$

V = asphalt volatility with a default value of -0.5
T = HMA mix temperature in ˚F with a default value of 325˚F.

Load Out, Yard, Silo Filling, Asphalt Storage Emissions
HAPs PAH and Phenol

compound	compound/ organic PM [a]	EF	emission rate	emission rate 8,760 hrs/yr	emission rate with 10 hr/day limit
		lb/ton	lb/hr	tons/yr	tons/yr
Load out and yard emissions - Total PAH HAPs	5.93%	7.85E-06	4.71E-04	2.06E-03	8.59E-04
Load out and yard emissions - Phenol	1.18%	1.56E-06	9.37E-05	4.10E-04	1.71E-04
Silo filling and asphalt storage tank - Total PAH HAPs	11.40%	1.12E-05	6.74E-04	2.95E-03	1.23E-03
Silo filling and asphalt storage tank - Phenol	ND				
Total PAH and Phenol HAPs				**5.43E-03**	**2.26E-03**

[a] The % compound/organic PM is from the AP-42 Table 11.1-15. To obtain the lb/ton emission factor, the % compound/organic PM is multiplied by the organic PM emission factor from the Drum Mix Plant Load Out and Silo Filling Emissions table.

Load Out, Yard, Silo Filling, Asphalt Storage Emissions
VOC and VO HAP Emissions

compound	compound/ TOC [a]	EF	emission rate	emission rate 8,760 hrs/yr	emission rate with 10 hr/day limit
		lb/ton	lb/hr	tons/yr	tons/yr
Load out and yard emissions - VOC	94%	1.52E-03	9.10E-02	3.99E-01	1.66E-01
Load out and yard emissions - Total VO HAPs	1.50%	2.42E-05	1.45E-03	6.36E-03	2.65E-03
Silo filling and asphalt storage tank - VOC	100%	4.73E-03	2.84E-01	1.24	5.18E-01
Silo filling and asphalt storage tank - Total VO HAPs	1.30%	6.15E-05	3.69E-03	1.62E-02	6.73E-03
Total VOC				**1.64**	**6.84E-01**
Total VO HAPs				**2.25E-02**	**9.39E-03**

[a] The % compound/TOC is from the AP-42 Table 11.1-16. To obtain the lb/ton emission factor, the % compound/TOC is multiplied by the TOC emission factor from the Drum Mix Plant Load Out and Silo Filling Emissions table.

Facility Emissions

pollutant	emission rate at 8,760 hrs/yr	emission rate with 10 hr/day drum mixer/dryer limit
	tons/yr	tons/yr
NO_x	25.75	17.32
CO	35.27	15.19
PM	16.90	7.13
PM_{10}	10.73	4.56
$PM_{2.5}$	7.40	3.17
SO_2	3.42	1.73
HC	10.21	4.35
HAPs	2.38	1.02

Air Quality Assessment:

The permittee performed an ambient air quality modeling analysis for the new diesel engine generator. The SCREEN3 model was used to predict the diesel engine generators maximum ambient air concentration. The following assumptions were used in this modeling assessment:

- operation of the diesel engine generator for 8,760 hours/year
- rural dispersion parameters
- default meteorology
- building downwash from nearby structure

GOOD ENGINEERING PRACTICE STACK HEIGHT (All dimensions in feet)								
Structure	Hgt	Length	Width	PW	L *	Hg **	Stack hgt	Distance to Stack
control house	8	12	8	14.4	8	20	19	36
storage silos	37	14	14	19.8	19.8	66.7	19	57

* DEG is within 5L of bldg. ** Hg (GEP stack height) = Height + 1.5 L, where L is smaller of PW or structure hgt.

The storage silo was entered into SCREEN3 as the potential downwash structure.

- flat terrain
- EPA short-term scaling factors
- state of Hawaii long-term scaling factor
- receptor location on the property site with no fence-line
- background air quality data from 2007: Kihei (PM_{10}), Kapolei (SO_2, NO_x, CO), Sand Island (O_3)

Stack Parameters and Emission Rates Input into the Model

stack	emission rates				stack parameters			
	SO_2 (g/s)	NO_x (g/s)	CO (g/s)	PM_{10} (g/s)	height (m)	temp (K)	vel (m/s)	diam (m)
DEG	0.015	0.325	0.024	0.004	6.10	845.15	18.13	0.1905

Ambient Air Quality Impacts [a]

AIR POLLUTANT	EMISS. RATE (g/s)	AVG. TIME	SCALING FACTOR	IMPACT [b] (μg/m3)	BCKGRD (μg/m3)	TOTAL IMPACT (μg/m^3)	AIR STD (μg/m^3)	% OF STD
SO_2	0.015	3-Hour	0.9	67	27	94	1,300	7%
		24-Hour	0.4	30	9	39	365	11%
		Annual	0.2	15	4	19	80	24%
NO_x	0.325	Annual	0.2	325	9	334	70	477%
NO_2 [c]	0.325	Annual	0.2	57	9	66	70	95%
CO	0.024	1-Hour	1.0	120	4,332	4452	10,000	45%
		8-Hour	0.7	84	863	947	5,000	19%
PM_{10}	0.004	24-Hour	0.4	8	93	101	150	67%
		Annual	0.2	5	26	31	50	62%
a	Based on the maximum 1 hour concentration of				**4,995**	μg/m^3 per g/sec 19 meters from the stack		
b	IMPACT = (Emiss. Rate) X (Scaling factor) X (maximum 1 hr concentration)							
c	Calculated NO_2 using the Ozone Limiting Method (OLM): NO_2 = (NO_x impact x 0.10) + O_3 max conc. ann. avg. period x (mol. wt. of NO_2/mol. wt of O_3) NO_2 = 325 μg/m^3 x 0.10 + 26 x (46/48) = 57 μg/m^3							

The ambient air quality analysis demonstrates the diesel engine generator will operate in compliance with state and national ambient air quality standards.

Significant Permit Conditions:

1. Stack Height

   The minimum stack height of the 209 kW diesel engine generator shall be 20 feet above ground elevation.

   Basis: The stack was raised from its original height to ensure compliance with the ambient air quality standards for NO_2.

2. Daily Operating Limit

   The total daily operating hours of the 60 TPH drum mixer/dryer shall not exceed ten (10) hours per day.

   Basis: Carried over from the previous permit. The limit was established to ensure compliance with the SO_2 and PM_{10} standards for the 24-hour averaging period.

Conclusion: In addition to the permit renewal the applicant is proposing to replace an existing 225 kW diesel engine generator with a new 209 kW (prime rating) diesel engine generator. The existing generator was limited to operating 4,000 hours per rolling twelve month period. No operating limits are proposed for the new diesel engine generator.

The applicant has requested the addition of an alternate operating scenario allowing for the temporary replacement of the diesel engine generator when the permitted unit is out of service for repair. The alternate operating scenario for temporary replacement of the diesel engine generator has been added to the permit.

An ambient air quality assessment was performed for the new diesel engine generator operating at its maximum capacity for 8,760 hours per year. Background ambient air concentrations were included in the modeling assessment. The analysis demonstrates the diesel engine generator will be operated in compliance with state and national ambient air quality standards.

The Department of Health recommends issuance of the covered source permit renewal and modification based on the review of the information submitted by the applicant and subject to the permit conditions, public comment period, and forty-five day EPA review.