PROPOSED

PERMIT APPLICATION REVIEW
COVERED SOURCE PERMIT No. 0380-01-C
Modification Application No. 0380-03
Renewal Application No. 0380-04

Applicant: Maui Paving, LLC

Facility: 174 TPH Drum Mix Hot Mix Asphalt (HMA) Plant

Location: Puunene Quarry, Mokulele Highway, Puunene, Maui
UTM Coordinates: 765,400 meters E, 2,303,907 meters N (NAD 83)

SIC Code: 2951 (asphalt paving mixtures and blocks)

Equipment: The 174 TPH Hot Mix Asphalt (HMA) Plant encompasses the following equipment and associated appurtenances:

1) 174 TPH ASTEC, model PDM-630-C portable drum mixer/dryer with 76 MMBtu/hr Hauck Starjet burner, model no. SJ-360;
2) Knock-out box;
3) ASTEC baghouse, model no. 95-153-437, serial no. 95-153-437;
4) 1,100 kW Catepillar diesel engine generator, model no. 3512, serial no. 24Z01234;
5) 75 Ton HMA storage silo;
6) 30 Ton HMA storage silo;
7) Three (3) compartment cold feed system (BIN), model no. PCF-810-3; and
8) Conveyor system.

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BACKGROUND

Permit renewal and modification applications are being processed for Maui Paving, LLC, for the operation of a 174 TPH drum mix hot mix asphalt (HMA) plant at Puunene Quarry on the island of Maui. The modification to the facility involves the addition of a baghouse that has replaced the venturi scrubber system for the plant. Maui Paving requested to operate the baghouse prior to permit modification, which was approved by the Department of Health on January 7, 2008

Existing permit conditions limit the total operating hours of the drum mixer to 2,250 hours per year and the diesel engine generator to 1,500 hours per year. Power for the facility is provided through the city power grid. The diesel engine will power the plant during power outages. The

drum mixer is fired on either fuel oil No. 2 with less than 0.5% sulfur by weight or cooking oil. The diesel engine generator is fired on fuel oil No. 2 with less than 0.5% sulfur by weight.

The plant has not moved since the initial temporary covered source permit was issued on November 12, 1998. Failure to move the plant at least once during the term of a covered source permit is in conflict with what is considered a temporary covered source as defined in Hawaii Administrative Rules (HAR) §11-60.1-81. Per conversation with consultant Chris Chun-Hoon of LFR Inc. and a letter dated December 9, 2008, Maui Paving, LLC has decided to convert the temporary covered source to a covered source.

The Standard Industrial classification code for this facility is 2951 (Asphalt Paving Mixtures and Blocks).

There are no changes proposed for the facility from the permit renewal application.

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
    - 11-60.1-37 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
    - 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

This source is **subject to NSPS** (New Source Performance Standards).
40 CFR 60 Subpart I, Standards of Performance for Hot Mix Asphalt Facilities applies if meeting the HMA plant was constructed or modified after June 11, 1973. The initial Permit to Operate for the plant was issued on March 5, 1993.

This source is **not subject to NESHAPS** (National Emission Standards for Hazardous Air Pollutants for Source Categories) as no hazardous air pollutants are emitted at significant levels (>= 10 TPY HAP or >= 25 TPY for total HAPs) and this source is not a listed under 40 CFR

Part 61 (National Emission Standards for Hazardous Air Pollutants) or 40 CFR 63 applicable to this facility.

This source is **not subject to MACT** (Maximum Achievable Control Technology) since the source is not a major source of hazardous air pollutants (HAPS) emissions (>10 TPY single hap or >25 TPY for total haps).

This source is **not subject to PSD** (Prevention of Significant Deterioration) 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; (criteria air pollutant > 100 or 250 TPY as applicable).

This source is **not subject to CAM** (compliance assurance monitoring) since the permitted equipment is not classified as a major source (criteria pollutant > 100 TPY); have pre-control device potential emissions exceeding applicable major source thresholds; fitted with an "active" air pollution control device; and is not part of a facility with total emissions exceeding major source threshold.

This source is **not subject to CERR** (Consolidated Emissions Reporting Requirements) since 40 CFR Part 51, Subpart A – Emissions Inventory Reporting Requirements, determines CERR based on facility wide emissions of each air pollutant at the CERR triggering levels. The emissions do not exceed respective CERR threshold levels. As such, emissions data will not be required to be inputted into the National Emissions Inventory (NEI) database.

The Clean Air Branch requests annual emissions reporting from those facilities that have facility wide emissions exceeding the DOH reporting level(s) and for all covered sources.

This source is **not subject to BACT** (Best Available Control Technology) analysis because, with the addition of the proposed equipment, emissions from the facility remain below significant emissions levels. BACT analysis is required for new sources and significant modifications to sources that have the potential to emit or increase emissions above significant levels.

A synthetic minor source is a facility that is potentially major (as defined in HAR 11-60.1-1), but is made nonmajor through federally enforceable permit conditions. This facility is a synthetic minor source based on potential CO and NO_X emissions that exceed the major source threshold when the facility is operated at its maximum capacity continuously for 8,760 hours per year.

INSIGNIFICANT ACTIVITIES (CSP) / EXEMPTIONS (NSP)

Proposed insignificant activities:

Portable Asphalt Heater
The facility utilizes one 0.4 MMBTU/hr portable diesel-fueled asphalt heater to heat up asphalt cement tank continuously. The tank is considered an insignificant source in accordance with HAR 11-60.1-82(f)(2) for fuel burning equipment with a heat input capacity less than 1 MMBTU/hour.

10,000 Gallon Diesel Storage Tank
Diesel fuel is stored in one 10,000 gallon AST. The volatile components of diesel fuel from the vented AST are considered insignificant in accordance with HAR 11-60.1-82.(f)(1).

10,000 Gallon Liquid Asphalt Cement Storage Tank
Asphalt cement is not considered volatile and the storage tank capacity is less than forty-thousand gallons, therefore, the tank is considered insignificant in accordance with HAR 11-60.1-82.(f)(1).

58 Gallon Portable Propane Storage Tank
The propane storage tank is considered insignificant in accordance with HAR 11-60.1-82.(f)(1).

Cooking Oil Storage Tank
The cooking oil is stored in two 5,000 gallon heated above-ground storage tanks. Since cooking oil is not a volatile substance and the storage tanks' capacity is less than forty-thousand gallons, the tanks are also listed as insignificant in accordance with HAR 11-60.1-82.(f)(1).

Diesel Engine Generator
The facility utilizes a 1,100 kW Caterpillar generator as an emergency. Emergency generators are considered insignificant in accordance with HAR 11-60.1-82.(f)(5). Despite being considered insignificant, the potential emissions from the generator is estimated and included in the facility wide emission calculations.

ALTERNATIVE OPERATING SCENERIOS

There are no proposed alternative operating scenarios for the drum mix HMA plant.

AIR POLLUTION CONTROLS

Knock Out Box
Control of particulate matter from the gas stream of the portable drum mixer is initially provided by a knock-out box (settling chamber), comprised of an enlarged area of duct-work at the end of the drum mixer that slows the velocity of the gas stream to allow the larger heavier particles to settle within the drum mixer. The manufacturer of the equipment, ASTEC Industries, Inc., indicates that the knock-out box is capable of removing 85% by weight of the total particles suspended by the gas stream. The remaining 15% will be further controlled by the baghouse.

The knock-out box is expected to reduce the PM emission by 85%. The remaining 15% will be further controlled by the baghouse. For worst case scenario, only the baghouse control factor was applied to estimate emission calculation from the drum mixer.

Baghouse
The baghouse servicing the drum mixer is designed to control PM emission with 99% efficiency. The 99% control efficiency is consistent with the standard for filter fabrics set forth in AP-42 Appendix B, Table B.2-3 (September 1996).

Water Suppression
Water spray is used as necessary to minimize fugitive emissions from the material stockpiles and trucks traveling on unpaved roads. Water suppression control efficiency is set at 70% as stated in AP-42 Chapter 11.19.1 (November 1995).

PROJECT EMISSIONS

Calculations are attached in the enclosures. Below are the emissions due to the various equipment and operations.

174 TPH Drum Mixer through a Baghouse

Emission rates were based on the maximum capacity of the drum mixer to process 174 TPH of hot mix and a limiting operating time of 2,250 hour/year to ensure compliance with state and federal ambient air quality standards. The drum mixer is fired on either fuel oil No. 2 with less than 0.5% sulfur by weight or cooking oil. Per current and previous applications, NO_X emissions from cooking oil were estimated to be 16% more than fuel oil no. 2, while all other emissions were estimated to be equivalent or less than those for fuel oil no. 2. Emissions calculated were based on the worst case between cooking oil and fuel oil no. 2. Emissions are summarized below.

174 TPH Drum Mixer Emissions			
Pollutant	Emission Rate (lb/hr)	Emission Rate (TPY) [2,250 hr/yr]	Emission Rate (TPY) [8,760 hr/yr]
PM	5.742	6.460	28.294
PM-10	4.002	4.502	19.720
CO	22.620	25.448	111.460
NO_X	11.101	12.489	54.701
SO_2	1.914	2.153	9.431
VOC	5.568	6.264	27.436
HAPs	1.532	1.723	6.706

1,100 kW Diesel Engine Generator (DEG)

Despite being considered insignificant, the potential emissions from the generator are estimated and included in the facility wide emission calculations. With a rating of 1,100 kw or 1475 hp, it is considered a large stationary DEG. Emission rates were based on a limiting operating time of 1,500 hours/year. The DEG is fired on fuel oil No. 2 with less than 0.5% sulfur by weight, with a maximum diesel consumption of 80.7 gallons/hour.

1,100 kW Diesel Engine Generator			
Pollutant	Emission Rate (lb/hr)	Emission Rate (TPY) [1,500 hr/yr]	Emission Rate (TPY) [8,760 hr/yr]
PM	1.106	0.829	4.842
PM-10	1.106	0.829	4.842
CO	9.398	7.048	41.161
NO_X	35.379	26.534	154.959
SO_2	5.583	4.187	24.455
TOC	0.995	0.746	4.358
HAPs	0.0165	0.0124	0.0722

Truck Loading/Unloading Aggregate

Emission rates were based on the maximum capacity of the drum mixer to process 174 TPH of hot mix and a limiting operating time of 2,250 hour/year. Fugitive emissions from the loading/unloading operation were due to the loading of aggregate from the stockpile to cold feed bin, and the unloading of aggregate to the stockpiles from trucks delivering aggregate into the facility and to the cold feed bin from the stockpiles.

Truck Loading/Unloading Aggregate			
Pollutant	Emission Rate (lb/hr)	Emission Rate (TPY) [2,250 hr/yr]	Emission Rate (TPY) [8,760 hr/yr]
PM	0.110	0.123	0.480
PM-10	0.052	0.059	0.229

Conveyor Transfer Points

Emission rates were based on the maximum capacity of the drum mixer to process 174 TPH of hot mix and a limiting operating time of 2,250 hour/year. Fugitive emissions from three conveyor transfer points were due to transfer aggregate from the cold feed bin to the drum mixer, and the transfer of hot mix asphalt from the drum mixer to two silos.

Conveyor Transfer Points			
Pollutant	Emission Rate (lb/hr)	Emission Rate (TPY) [2,250 hr/yr]	Emission Rate (TPY) [8,760 hr/yr]
PM	1.566	1.762	6.859
PM-10	0.574	0.646	2.515

Storage Piles

Emission rates were based on the maximum capacity of the drum mixer to process 174 TPH of hot mix and a limiting operating time of 2,250 hour/year. Emissions are due to wind erosion on the aggregate storage piles.

Storage Piles			
Pollutant	Emission Rate (lb/hr)	Emission Rate (TPY) [2,250 hr/yr]	Emission Rate (TPY) [8,760 hr/yr]
PM	1.232	1.386	5.396
PM-10	0.616	0.693	2.698

Silo Filling

Emission rates were based on the maximum capacity of the drum mixer to process 174 TPH of hot mix and a limiting operating time of 2,250 hour/year. Emissions are due to the HMA silo filling operation.

Silo Filling			
Pollutant	Emission Rate (lb/hr)	Emission Rate (TPY) [2,250 hr/yr]	Emission Rate (TPY) [8,760 hr/yr]
PM	0.102	0.115	0.447
CO	0.205	0.231	0.899
VOC	2.120	2.386	9.288
HAPs	0.033	0.037	0.143

Truck Load Out

Emission rates were based on the maximum capacity of the drum mixer to process 174 TPH of hot mix and a limiting operating time of 2,250 hour/year. Emissions are due to the HMA load out operation from silo to trucks.

Truck Load Out			
Pollutant	Emission Rate (lb/hr)	Emission Rate (TPY) [2,250 hr/yr]	Emission Rate (TPY) [8,760 hr/yr]
PM	0.091	0.102	0.098
CO	0.235	0.264	1.028
VOC	0.680	0.765	2.979
HAPs	0.023	0.026	0.100

Truck Travelling on Unpaved Road

Emission rates were based on the maximum capacity of the drum mixer to process 174 TPH of hot mix and a limiting operating time of 2,250 hour/year. From the previous review, the average weight of the vehicles is 26.8 tons, with 8628 miles/year travelled.

Truck Travelling on Unpaved Road			
Pollutant	Emission Rate (lb/hr)	Emission Rate (TPY) [2,250 hr/yr]	Emission Rate (TPY) [8,760 hr/yr]
PM	9.759	10.979	42.745
PM-10	2.881	3.241	12.617

Total Emissions

Total facility emissions are summarized within the immediate table below.

Total Facility Emissions and Trigger Levels (TPY)					
Pollutant	Proposed Emissions after control (OPR LIMITED)	Proposed Emissions based on 8,760 hr/yr (ANNUAL – NO LIMIT)	Significant BACT Level	CERR Level	DOH Level
PM	21.76	89.46	25	-	25
PM-10	10.19	46.16	15	100	25
CO	32.99	153.52	100	1000	250
NO_X	39.02	209.66	40	100	25
SO_2	6.34	33.89	40	100	25
TOC/VOC	10.16	44.06	40	100	25
HAPs	1.80	7.02	-	5	5

AIR QUALITY ASSESSMENT

An ambient air quality analysis (AAQA) was conducted for the drum mixer and diesel engine generator to demonstrate compliance with state and national ambient air quality standards. EPA approved SCREEN3 method was used. Results attached to review.

The table below presents the emission rates and stack parameters used for the AAQA. Pb and H_2S assumed to be negligible.

	Emission Rates (g/s)				Stack Parameters			
	NO_2	SO_2	PM-10	CO	Height (m)	Temp (°K)	Velocity (m/s)	Diameter (m)
Drum Mixer	1.40	0.21	0.50	2.85	10.8	338	28.08	1.090
DEG	4.46	0.70	0.14	1.18	12.04	797	59.31	.2032

Assumptions for the SCREEN3 model included:
a. Simple terrain impacts
b. Rural dispersion parameters
c. Wake effects from the 75 ton silo (LxWxH = 14 x 12 x 56 ft = 4.27 x 3.66 x 17.07 m)
d. Default meteorology

The maximum one hour concentration of 151.0 μg/m^3 was predicted at a distance of 57 meters from the drum mixer (based on a 1 to 1,000 meter domain with 100 meter increments).

The maximum one hour concentration of 271.4.0 μg/m^3 was predicted at a distance of 57 meters from the diesel engine generator (based on a 1 to 1,000 meter domain with 100 meter increments).

The predicted concentrations assume drum mixer operation at proposed 2,250 hr/yr, and diesel engine generator at proposed 1,500 hr/yr. Based on these assumptions, the combined emissions impact from the drum mixer and diesel engine generator should comply with state and federal ambient air quality standards as shown in the following table.

Air Pollutant	Averaging Time	HMA Plant Impact (μg/m^3)*	DEG Impact (μg/m^3)*	Background (μg/m^3)**	Total Impact (μg/m^3)	SAAQS (μg/m^3)	NAAQS (μg/m^3)	Compared to SAAQS
NO_2	Annual	10.8	41.4	9	61.3	70	100	87.5%
SO_2	3-hr	32.8	171.8	451	655.6	1300	1300	50.4%
	24-hr	14.6	76.4	161	251.9	365	365	69.0%
	Annual	1.9	6.5	11	19.4	80	80	24.3%
PM-10	24-hr	30.5	15.1	72	117.6	150	150	78.4%
	Annual	3.9	1.3	22	27.2	50	50	54.4%
CO	1-hr	430.4	321.4	2850	3601.7	10000	40000	36.0%
	8-hr	301.3	225.0	1967	2493.2	5000	10000	49.9%

notes:
* Applied EPA scaling factors of 0.9, 0.7, and 0.4 for the 3-hour, 8-hour, and 24-hour concentrations are used, respectively. State of Hawaii scaling factor of 0.2 is used for annual concentrations. A total conversion of NO to NO_2 is assumed.

** Background Concentration obtained from "Annual Summary 2006 Hawaii Air Quality Data". Representative data for the island of: **MAUI.**

For: 1-Hour Carbon Monoxide: Oahu, Honolulu – Maximum 1st High (NO DATA, MOST CONSERVATIVE)
For: 8-Hour Carbon Monoxide: Oahu, University – Maximum 1st High (NO DATA, MOST CONSERVATIVE)

For: Annual Nitrogen Dioxide: Oahu, Kapolei – (NO DATA, MOST CONSERVATIVE)

For: 3-Hour Sulfur Dioxide: Hawaii, Hilo – Maximum 1st High (NO DATA, MOST CONSERVATIVE)
For: 24-Hour Sulfur Dioxide: Hawaii, Hilo – Maximum 1st High (NO DATA, MOST CONSERVATIVE)

For: Annual Sulfur Dioxide: Hawaii, Kona – Annual Mean (NO DATA, MOST CONSERVATIVE)

For: 24-Hour Particulate Matter 10: Maui, Kihei – Maximum 1st High (MOST CONSERVATIVE)
For: Annual Particulate Matter 10: Maui, Kihei – Annual Mean (MOST CONSERVATIVE)

For: 24-Hour Particulate Matter 2.5: Oahu, Honolulu – Maximum 1st High (NO DATA, MOST CONSERVATIVE)
For: Annual Particulate Matter 2.5: Oahu, Sand Island – Annual Mean (NO DATA, MOST CONSERVATIVE)

SIGNIFICANT PERMIT CONDITIONS

New significant permit conditions consist of the following:

1) Replacement of the Venturi scrubber with a baghouse

2) Conversion of the temporary cover source permit to a covered source permit.

CONCLUSION

Actual emissions will probably be less than those estimated. The knock-out box pollution control was not applied to the calculations, and the diesel engine generator was included in the facility wide emission calculations despite being considered insignificant. Also, the emissions for the drum mixer were calculated using the worst case emissions between cooking oil and fuel oil No. 2.

Based on the information submitted by Maui Paving, LLC, it is the determination of the Department of Health (DOH) that the proposed project will be in compliance with the Hawaii Administrative Rules (HAR), Chapter 11-60.1 and State and Federal ambient air quality standards. Recommend issuance of the covered source permit subject to the incorporation of the significant permit condition, 30-day public comment period, and 45-day Environmental Protection Agency review period.

Mark Saewong
11/26/2008