

**PERMIT APPLICATION REVIEW
COVERED SOURCE PERMIT No. 0714-01-CT
Application for Renewal No. 0714-02**

Company: Grace Pacific LLC

Mailing Address: P.O. Box 78
Honolulu, HI 96810

Facility: 334 TPH Hot Mix Asphalt Plant

Location: Various Temporary Sites, State of Hawaii

Proposed Location: 91-500 Malakole Street, Kapolei, Oahu
UTM: Zone 4, 596,953 m E, 2,361,208 m N (NAD 83)

SIC Code: 2951 (Asphalt Paving Mixtures & Blocks)

Responsible Official: Mr. Robert Creps
Senior Vice President of Administration
Ph: (808) 674-8383

Site Contact: Mr. Joseph Shacat
Environmental Compliance Manager
Ph: (808) 674-8383

Mr. Scott Komatsu
Plant Manager
Ph: (808) 306-7991

Consultant: Arcadis US, Inc.
1003 Bishop Street, Suite 2000
Honolulu, HI 96813
Ph: (808) 522-0321
Fax: (808) 522-0366

BACKGROUND

Grace Pacific LLC, formerly Grace Pacific Corporation, has submitted a covered source permit renewal application for an existing 334 ton per hour (TPH) hot mix asphalt (HMA) plant.

The plant produces HMA from virgin aggregate, reclaimed asphalt pavement (RAP), and liquid asphalt cement. Virgin aggregate is transferred from storage piles to cold feed storage bins by front-end loaders. From the storage bins, the aggregate falls onto conveyors, which transport the aggregate to a vibrating scalping screen and then to the drum mixer. Front-end loaders also transfer RAP from storage piles to a RAP feed bin. The RAP is sent to a scalping screen and then transported to the drum mixer by conveyors. Liquid asphalt cement is added to the aggregate and RAP blends in the drum mixer. The final product is transported from the drum mixer to the storage silos by a drag conveyor.

Existing permit conditions limit HMA production to 540,000 tons per any rolling twelve-month (12-month) period, and combined maximum fuel consumption of the 900 kW and 750 kW diesel engine generators (DEGs) to 189,050 gallons per any rolling twelve-month (12-month) period, with a maximum of 29,300 gallons for the 725 kW DEG.

The drum mixer is permitted to burn only one or a combination of the following fuels:

1. Fuel oil no. 2 with a maximum sulfur content not to exceed 0.5% by weight;
2. Unitek diesel with a maximum sulfur content not to exceed 0.5% by weight;
3. Biodiesel;
4. Cooking oil; and
5. Synthetic natural gas (SNG) or Liquid petroleum gas (LPG).

The 900 kW and 750 kW DEGs shall not be operated simultaneously and are permitted to burn only one or a combination of the following fuels:

1. Fuel oil no. 2 or biodiesel with a maximum sulfur content not to exceed 0.0015% by weight, and a minimum cetane index of forty (40) or a maximum aromatic content of 35% by volume; and
2. SNG or LPG.

The modification to the plant's operation is installation of diesel oxidation catalyst control and an open crankcase ventilation system on the 725 kW Caterpillar DEG to achieve compliance with the emission limits in 40 Code of Federal Regulations (CFR) Part 63 Subpart ZZZZ – 23 parts per million by dry volume (ppmdv) CO corrected to 15% O₂ or 70% CO reduction.

EQUIPMENT DESCRIPTION

Equipment	Capacity	Manufacturer	Model No.	Serial No.	Manufacture Date
Drum Mixer	334 TPH	Astec Inc.	PDDC-835C	92-152	-
Baghouse	58,255 CFM	Astec Inc.	RBH-58:DB	92-152437	12/1992
Primary DEG	900 kW (prime)	Cummins	Generator: 1000DQFAD Engine: QST30-G5 NR2	D070044706	4/18/2007
Backup DEG	725 kW (prime)	Caterpillar	3412	2WJ01364	1996
Catalytic Converter ¹	-	Johnson Matthey	MQB30-C-SS-EIEO-141-140-H	MQB-164550-000	-
Crankcase Ventilation System	-	Solberg	30CFMSD18014 rev. B	-	-
RAP Scalping Screen	275 TPH, single deck, 4' x 8'	Telsmith	VK481	363M474	-
Aggregate Scalping Screen	single deck, 4' x 12'1"	Diester	USM-1412	579262	11/1992

Equipment	Capacity	Manufacturer	Model No.	Serial No.	Manufacture Date
Fiberbed Mist Collector	12,000 CFM	Astec Inc.	BSC-16-FBF	06-041	2006
HMA Storage System	Three (3) 100-ton silos	Astec Inc.	-	-	-
After-hours DEG (Insignificant)	72 kW (prime)	Cummins	Generator: 80DSFAE Engine: QSB5-G3 NR3	To Be Determined	2008
Hot Oil Heater (Insignificant)	1.5 MMBtu/hr	Heatec	HC-120	109260088	-

Equipped with HAP Guard Exhaust Temperature and Pressure Monitor.

AIR POLLUTION CONTROLS

Knock Out Box and Baghouse

Control of particulate matter from the exhaust gases of the 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 baghouse filters the remaining fine particles.

Fiberbed Mist Collector System

The fiberbed mist collector system is used to control and minimize "blue smoke" emissions from silo-filling and load-out operations. Blue smoke is a visible aerosol emission that consists predominantly of organic and inorganic PM, VOC, and CO. A 95% control efficiency is assumed for PM emissions and no control of HAPs is assumed.

Diesel Oxidation Catalyst Control & Crankcase Ventilation System

Oxidation catalyst is an add-on catalytic control device that controls CO and VOC by oxidation. An open crankcase filtration emission control system reduces emissions from the crankcase by filtering the exhaust stream to remove oil mist, particulates, and metals. The two devices are installed on the 725 kW DEG to control CO emissions.

Water Suppression

Water spray is used as necessary to minimize fugitive emissions from the material stockpiles, truck unloading, conveyor transfer points, and trucks traveling on paved roads. Water suppression is assumed to be 70% efficient.

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
 - 11-60.1-161 (1), Subpart A, General Provisions
 - 11-60.1-161 (11), Subpart I, Standards of Performance for Hot Mix Asphalt Facilities
- Subchapter 9, Hazardous Air Pollutant Sources
- Subchapter 10, Field Citations

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

Subpart I, *Standards of Performance for Hot Mix Asphalt Facilities* is applicable to the 334 TPH HMA facility because the plant commenced construction or modification after June 11, 1973.

Subpart IIII, *Standards of Performance for Stationary Compression Ignition Internal Combustion Engines* is applicable to the 900 kW DEG because the engine commenced construction after July 11, 2005, and was manufactured after April 1, 2006. For purposes of Subpart IIII, the date that construction commences is the date the engine is ordered. Manufacturer's specifications indicate the generator is EPA Tier 2 certified.

Subpart IIII is not applicable to the backup 725 kW DEG because it was manufactured before April 1, 2006.

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

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

National Emission Standards for Hazardous Air Pollutants for Source Categories (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 applicable to the 900 kW DEG because the engine is a new stationary RICE. A stationary RICE located at an area source of HAP emissions is new if you commenced construction of the stationary rice on or after June 12, 2006. A new stationary RICE located at an area source must meet the requirements of this part by meeting the requirements of 40 CFR Part 60, Subpart IIII. No further requirements apply for such engines under this part.

Subpart ZZZZ is applicable to the 725 kW DEG because the engine is an existing stationary RICE. For stationary RICE located at an area source of HAP emissions, a stationary RICE is existing if you commenced construction or reconstruction of the stationary RICE before June 12, 2006. The permittee must comply with the applicable emission limitations and operating limitations no later than May 3, 2013.

Prevention of Significant Deterioration (PSD), 40 CFR 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 since 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 CFR 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.

Air Emissions Reporting Requirements (AERR), 40 CFR Part 51, Subpart A

AERR is not applicable because potential emissions from the facility do not exceed the AERR triggering levels (see table below).

Pollutant	Total Emissions (TPY) ¹ [540,000 TPY]	AERR Triggering Levels (TPY)	
		1 year cycle (type A sources)	3 year cycle (type B sources)
CO	38.62	2500	1000
NO _x	39.45	2500	100
SO ₂	33.57	2500	100
PM	27.54	-	-
PM ₁₀	11.63	250	100
PM _{2.5}	8.04	250	100
VOC	13.45	250	100
Lead (Pb)	0.0041	5	5
HAPs	2.47	-	-

¹ See Project Emissions section.

Department of Health (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. This facility is subject to annual emissions reporting requirements as a covered source.

Best Available Control Technology (BACT)

A 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, Section 11-60.1-1. This source is not subject to a BACT analysis because there is no net increase in potential emissions due to the modification.

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 a synthetic minor source because potential CO, NO_x, SO₂, and PM emissions exceed major source thresholds when the facility is operated without limitations for 8,760 hours/year. See Project Emissions section.

INSIGNIFICANT ACTIVITIES

72 kW Diesel Engine Generator

The facility will operate a 72 kW Cummins Model QSB5-G3-NR3 DEG during off-hours when the plant is not in operation. The full prime fuel consumption is 6.3 gal/hr based on manufacturer's data. Assuming a fuel oil no. 2 heating value of 0.14 MMBtu/gal, the heat input rate equates to 6.3 gal/hr x 0.14 MMBtu/gal = 0.88 MMBtu/hr. It is considered insignificant in accordance with HAR 11-60.1-82.(f)(2) as the heat input rate is less than 1 MMBtu/hr.

Hot Oil Heater

The 1.5 MMBtu/hr hot oil heater is considered an insignificant activity in accordance with HAR 11-60.1-82.(f)(7) because emissions are below the required levels of 0.25 tpy for HAPs, 0.15 tpy for lead, 5.0 tpy for CO, and 2.0 tpy for NO_x, SO₂, PM & VOC.

Emissions are estimated for firing the heater on fuel oil no. 2 with 0.05% (by weight) sulfur content, and determined by emission factors from AP-42, Section 1.3 (5/10) – *Fuel Oil Combustion*. NO_x emissions from biodiesel is increased by 10% over fuel oil no. 2 based on Figure ES-A of EPA's report, "A Comprehensive Analysis of Biodiesel Impacts on Exhaust Emissions" (EPA420-P-02-001), dated October 2002.

Hot Oil Heater	
Pollutant	Emissions (TPY) [8,760 hr/yr]
CO	0.23
NO _x	1.03
SO ₂	0.33
PM	0.094
PM ₁₀	0.051
PM _{2.5}	0.039
VOC	0.016
Lead (Pb)	5.91E-05
HAPs	0.0037

See attached emission calculation spreadsheets.

Emissions are based on the worst-case scenario. In the permit renewal application, it's indicated that the hot oil heater is fired on SNG or LPG.

Storage Tanks

The following storage tanks are considered insignificant activities in accordance with HAR §11-60.1-82(f)(1) because their capacities are less than 40,000 gallons:

1. One (1) 2,000-gallon diesel fuel tank;
2. Two (2) 10,000 -gallon diesel fuel tanks;
2. Two (2) 30,000-gallon liquid asphalt cement storage tanks; and
3. Four (4) 8,000-gallon SNG or LPG storage tanks.

Emissions from the insignificant activities and permitted equipment (operated under limitations) are less than major source levels.

ALTERNATIVE OPERATING SCENERIOS

Diesel Engines

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

PROJECT EMISSIONS

Emissions from Drum Mixer through Baghouse

Emissions are based on the maximum capacity of the drum mixer to process 334 TPH of HMA with a limited annual production of 540,000 TPY. CO, NO_x, PM, PM₁₀, PM_{2.5}, VOC, and HAPs emissions are determined with emission factors from AP-42 Section 11.1 (3/04) – *Hot Mix Asphalt Plants* for fuel oil no. 2. SO₂ emission factor is from AP-42 Section 1.3 (5/10) - *Fuel Oil Combustion* for fuel oil no. 2. The sulfur content of biodiesel is essentially zero. Unitek diesel emissions are comparable to fuel oil no. 2 based on the previous reviews for this facility. Cooking oil is assumed to generate more NO_x than fuel oil no. 2 by 23% based on data provided by the applicant. The table below summarizes the worst case emissions from the permitted fuels.

Pollutant	Drum Mixer	
	Emissions (TPY)	
	540,000 TPY	8,760 hr/yr
CO	35.10	190.18
NO _x	18.27	98.97
SO ₂	33.55	181.77
PM	8.91	48.28
PM ₁₀	6.21	33.65
PM _{2.5}	5.94	32.18
VOC	8.64	46.81
Lead (Pb)	0.0041	0.022
HAPs	2.38	12.88

See attached emission calculation spreadsheets.

900 kW and 725 kW DEGs

The two DEGs have a total combined fuel consumption limit of 189,050 gal/yr. The 725 kW DEG has a 29,300 gal/yr limit. The maximum total emissions occur when the 900 kW DEG operates at 159,750 gal/yr and the 725 kW DEG operates at 29,300 gal/yr.

Emissions are based on fuel oil no. 2 emission factors from AP-42 Section 3.4 (10/96) – *Gasoline and Diesel Industrial Engines* and manufacturer’s data. NO_x emission factor is increased by 10% for biodiesel based on the EPA report, *A Comprehensive Analysis of Biodiesel Impacts on Exhaust Emissions, October 2002*.

Emissions are summarized in the tables below.

900 kW DEG		
Pollutant	Emissions (TPY)	
	159,790 gal/yr	8,760 hr/yr
CO	2.11	7.40
NO _x	16.03	56.17
SO ₂	0.02	0.059
PM	0.40	1.40
PM ₁₀	0.38	1.35
PM _{2.5}	0.36	1.26
VOC	0.29	1.02
Lead (Pb)	-	-
HAPs	0.017	0.058

† See attached emission calculation spreadsheets.

725 kW DEG		
Pollutant	Emissions (TPY)	
	29,300 gal/yr	8,760 hr/yr
CO	0.73	12.72
NO _x	5.15	90.24
SO ₂	0.0031	0.05
PM	0.18	3.07
PM ₁₀	0.17	2.94
PM _{2.5}	0.16	2.76
VOC	0.17	2.98
Lead (Pb)	-	-
HAPs	0.0031	0.054

† See attached emission calculation spreadsheets.

HMA Silo Filling and Load-Out Operations through Fiberbed Mist Collector

Emissions from HMA silo filling and truck load-out operations are estimated using emission factors from AP-42, Section 11.1 (3/04) – *Hot Mix Asphalt Plants*. A 95% control efficiency is assumed for the fiberbed mist collector system for particulate emissions. Emissions are summarized in the table below.

HMA Silo Filling		
Pollutant	Emissions (TPY)	
	540,000 TPY	8,760 hr/yr
CO	0.32	1.73
NO _x	-	-
SO ₂	-	-
PM	0.0079	0.043
PM ₁₀	0.0079	0.043
PM _{2.5}	0.0079	0.043
VOC	3.29	17.83
Lead (Pb)	-	-
HAPs	0.051	0.27

† See attached emission calculation spreadsheets.

HMA Truck Load-out		
Pollutant	Emissions (TPY)	
	540,000 TPY	8,760 hr/yr
CO	0.36	1.97
NO _x	-	-
SO ₂	-	-
PM	0.038	0.038
PM ₁₀	0.038	0.038
PM _{2.5}	0.038	0.038
VOC	1.06	5.72
Lead (Pb)	-	-
HAPs	0.023	0.13

† See attached emission calculation spreadsheets.

Fugitive Emissions

Emissions due to aggregate handling, wind erosion from aggregate stockpiles, and truck travelling on paved roads are summarized in the tables below. A 70% control efficiency is assumed for water suppression.

Aggregate handling includes truck unloading to storage piles, aggregate and RAP scalping screens, and conveyor transfer points. Particulate emissions are estimated using AP-42, Section 11.19.2 (8/04) – *Crushed Stone Processing and Pulverized Mineral Processing*.

Aggregate Handling		
Pollutant	Emissions (TPY)	
	540,000 TPY	8,760 hr/yr
PM	6.24	33.81
PM ₁₀	2.21	11.99
PM _{2.5}	0.94	5.07

† See attached emission calculation spreadsheets.

Windblown fugitive dust emissions from aggregate stockpiles are determined with the emission factors from AP-42 Section 8.19.1 (9/85) – *Sand and Gravel Processing*, Table 8.19.1-1 (4th edition).

Wind Erosion from Stockpiles		
Pollutant	Emissions (TPY)	
	PM	
PM ₁₀		0.43
PM _{2.5}		0.066

† See attached emission calculation spreadsheets.

Particulate emissions from vehicle travel on paved roads are estimated using AP-42, Section 13.2.1 (1/11) – *Paved Roads*.

Truck Travelling on Paved Roads		
Pollutant	Emissions (TPY)	
	540,000 TPY	8,760 hr/yr
PM	10.89	58.98
PM ₁₀	2.18	11.80
PM _{2.5}	0.53	2.90

† See attached emission calculation spreadsheets.

Total Facility Emissions

Facility-wide emissions are summarized in the table below.

Pollutant	Total Emissions (TPY)	
	Limited	8,760 hr/yr
CO	38.62	214.01
NO _x	39.45	245.38
SO ₂	33.57	181.88
PM	27.54	146.50
PM ₁₀	11.63	62.23
PM _{2.5}	8.04	44.32
VOC	13.45	74.36
Lead (Pb)	0.0041	0.022
HAPs	2.47	13.39

† See attached emission calculation spreadsheets.

Greenhouse Gas (GHG) Emissions

Total GHG emissions on a CO₂ equivalent (CO₂e) basis using the global warming potential (GWP) of the GHG are summarized in the table below.

GHG	GWP	GHG CO ₂ e Based Emissions (TPY)	
		Limited	8,760 hr/yr
Carbon Dioxide (CO ₂)	1	11,093.53	60,670.66
Methane (CH ₄)	25	83.00	450.25
Nitrous Oxide (N ₂ O)	298	35.76	199.66
Total Emissions		11,212.29	61,320.57

† See attached emission calculation spreadsheets.

AMBIENT AIR QUALITY ASSESSMENT

An ambient air quality assessment (AAQA) is generally required for new sources or modified sources with emission increases. An AAQA is not conducted for this renewal because there is no increase in emissions.

SIGNIFICANT PERMIT CONDITIONS

The significant conditions remain the same as in the engineering review of application for minor modification no. 0714-01 and the permit issued on July 12, 2013.

CONCLUSION

Recommend issuance of the renewal for the covered source permit subject to the incorporation of the significant permit conditions, thirty (30) day public comment, and forty-five (45) day EPA review.

Jing Hu
January 21, 2015