PERMIT APPLICATION REVIEW
COVERED SOURCE PERMIT No. 0522-01-C
Application for Renewal No. 0522-06

Company:	Grace Pacific Corporation
Mailing Address:	P.O. Box 78 Honolulu, HI 96810
Facility:	300 TPH Kapaa Asphalt Plant
Location:	Kapaa Quarry, Kailua, Oahu 96734 UTM Coordinates: 626,200 m East, 2,366,050 m North, Zone 4 (NAD 83)
SIC Code:	2951 (Asphalt Paving Mixtures & Blocks)
Responsible Official:	Mr. Robert Creps Senior Vice President, Administration Ph: (808) 674-8383
Site Contact:	Mr. Joseph Shacat Environmental Compliance Manager Ph: (808) 674-8383
Consultant:	Arcadis US, Inc. 220 South King Street, Suite 1290 Honolulu, HI 96813 Ph: (808) 522-0321 Fax: (808) 522-0366

BACKGROUND

Grace Pacific Corporation has submitted a covered source permit renewal application for an existing 300 ton per hour (TPH) hot mix asphalt (HMA) plant.

Reclaimed asphalt pavement (RAP) materials and cold feed aggregates are transported to the facility by trucks and dumped into the RAP hopper and cold feed bins for storage. The materials are transported to the drum mixer by a series of belt conveyors according to predetermined proportions. Asphalt cement from the nearby storage tank(s) is weighed and pumped to the drum mixer as required. The drum-mixing process heats and blends the cold feed aggregates and RAP materials with asphalt cement in the drum mixer. The drum mixer exhausts through a baghouse to control particulate emissions. The paving mixture product from the drum mixer is transported via a bucket elevator to the silos for temporary storage prior to truck loadout. Emissions from the product storage silos and truck load-out operations are vented to a fiberbed mist collector to control organic and inorganic particulate emissions as well as volatile organic compounds (VOCs). Grace Pacific has proposed to remove the fiberbed mist collector in this application. Other facility emissions occur from raw material storage piles and vehicle travel on paved and unpaved roads.

Electricity for the facility is supplied by the local utility grid.

Existing permit conditions limit HMA production to 1,200,000 tons per any rolling twelve-month (12-month) period and plant operation to eighteen (18) hours per day. The drum mixer is permitted to burn fuel oil no. 2 or alternate fuels with a maximum sulfur content for each fuel not to exceed 0.5% by weight. Alternate fuels include biodiesel, Ecodiesel supplied by Unitek Solvent Services, Inc., grease trap oil/cooking oil, and aviation fuels (Jet-A, Jet-A1, JP-4, JP-5, JP-8, etc.).

The changes/modifications to the plant's operation include:

1. The addition of a 200 ton Astec HMA silo to provide additional storage and improve operational efficiency at the facility.

   The Department received the permittee's request to install and operate the third silo on July 26, 2013. The Department approved this request on August 14, 2013 based on the predicted insignificant emission increases from the change and that there is no increase in plant capacity due to the plant's production limit by the permit.

   The submitted calculations assumed the worst case scenario in which 100% of the plant's production passes through the new (uncontrolled) silo instead of the two (2) existing silos that are connected to the fiberbed mist collector for fugitive emission control. The predicted increases in emissions are considered insignificant as defined by HAR §11-60.1-82(f)(7) since the increase in hazardous air pollutants (HAPs) is below 500 lb/yr and the increase in each other regulated pollutant is less than two (2) tons per year (TPY).

2. The addition of an Astec Double Barrel Green System to produce warm mix asphalt.

   The Department received the permittee's request to install and operate a warm mix asphalt retrofit system on April 17, 2012. The Department approved this request on May 11, 2012 based on the statement in the request letter that there are no emission increases for operating this system; and also, manufacturer's literature indicates that the system reduces energy consumption, lowers emissions, and eliminates visible smoke.

3. The addition of a glass feed bin to incorporate recycled glass into the asphalt pavement production.

   The Department received the permittee's notification to install and operate a single bin RAP system for glass on 12/9/2008.

   Per Mr. Joseph Shacat's e-mail on November 21, 2014, Grace Pacific Corporation is no longer using glass as a feedstock for the HMA product and the glass bin has been converted to be used as a second RAP bin. This allows them to increase the amount of recycled asphalt that is incorporated into the mix. It doesn't require any physical changes to the bin itself, or the number of transfer points, or any other aspects that would have an impact on fugitive or stack emissions.

4. The removal of the existing Astec fiberbed mist collector.

   With the permit renewal application, the permittee proposes to remove the 12,000 cubic feet per minute (CFM) fiberbed mist collector servicing silo filling and truck load-out operations.

EQUIPMENT DESCRIPTION

Equipment	Manufacturer	Model No.	Serial No.	Maximum Capacity
Double-Barrel Counter Flow Drum Mixer	Astec Industries, Inc.	RDB 8438	02-092-2204	300 TPH
Drum Mixer Burner	Astec Industries, Inc.	WJ75UO/G1	02-092-2206	75 MMBtu/hr
Baghouse with Cyclone	Astec Industries, Inc.	SBH-59:BP	94-109-217	51,110 CFM
Cold Feed System	Astec Industries, Inc.	-	-	5-bin storage
Scalping Screen for Cold Feed System	Astec Industries, Inc.	-	-	-
RAP Feed System	Astec Industries, Inc.	-	-	-
Single RAP Feed Bin	Astec Industries, Inc.	FRB1014	07-238-4401	Struck capacity of 28.5 tons; heaped capacity of 38.4 tons
Scalping Screen for RAP Feed System	Astec Industries, Inc.			
HMA Storage System	Astec Industries, Inc.	-	-	Three (3) 200-ton storage silos & 300 TPH bucket elevator

AIR POLLUTION CONTROLS

1. Baghouse

   The Astec baghouse, servicing the drum mixer, is designed to control particulate emissions with 99% efficiency. Control efficiency of 99% is in accordance with the standard for fabric filter set forth in AP-42 Appendix B.2 (1/95), Table B.2-3.

2. Cyclone

   A stand-alone vertical cyclone is utilized in addition to the baghouse. This cyclone is attached to the front section of the baghouse, and is designed to remove particulate matter (PM) that is larger than 200 mesh from the drum mixer exhaust stream. The finer particles within the stream are filtered out in the baghouse. Collected particles from both the cyclone and baghouse filters are stored in a containment bin for resuse in the drum mixer.

3. Storage Bins

   Cold feed aggregate storage bins are constructed with a roof and three-side walls to reduce potential erosion from wind and stormwater on the storage piles. The bins also allow the piles to form flat surfaces below the top of the bins' walls instead of cones. A flat surface emits significantly less dust than conical surface when exposed to wind.

4. Water Suppression

   Water spray is used as necessary to minimize fugitive emissions from material stockpiles, trucks traveling on unpaved roads, truck unloading, wind erosion on open bins and conveyor's transfer points. Water suppression control efficiency is set at 70% as stated in AP-42 Section 11.19.1.2 (11/95) – *Sand and Gravel Processing*, *Emissions and Controls*, paragraph 3.

5. Fuels

   Fuel oil no. 2 consumed by the drum mixer should not exceed 0.5% sulfur by weight. The combustion of alternative biodiesel and grease trap fuel oil will result in a significant reduction in emissions of criteria pollutants with the exception of oxides of nitrogen (NO_X).

6. Paved Road

   Portion of the road within the facility is paved to minimize fugitive emissions from vehicle traveling. A routine housekeeping is performed on a regular basis to clean the area of dust, dirt and debris.

7. Fugitive Dust Best Management Practice

   The facility implements and maintains a dust management plan to minimize dust emissions to the maximum extent practicable.

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
  - 11-60.1-38, 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
  - 11-60.1-114, 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 10, Field Citations

Standard 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 300 TPH HMA facility because the plant commenced construction after June 11, 1973.

National Emission Standards for Hazardous Air Pollutants (NESHAPS), 40 CFR Part 61
The facility is not a major stationary source of HAPs and is not subject to any NESHAPS requirements under 40 CFR Part 61.

National Emission Standards for Hazardous Air Pollutants for Source Categories (Maximum Achievable Control Technology (MACT)), 40 CFR Part 63
The facility is not a major stationary source of HAPs and is not subject to any MACT requirements under 40 CFR Part 63.

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	**Potential Emissions (TPY)[1] [1,200,000 TPY]**	**AERR Triggering Levels (TPY)**	
		1 year cycle (type A sources)	**3 year cycle (type B sources)**
CO	79.52	2500	1000
NO_X	36.30	2500	100
SO_2	6.60	2500	100
PM	38.11	-	-
PM_{10}	20.11	250	100
$PM_{2.5}$	14.56	250	100
VOC	28.86	250	100
Lead (Pb)	0.0090	5	5
HAPs	5.45	-	-

[1] See attached emission calculation spreadsheets.

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.

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 for carbon monoxide (CO) based on the potential emission that exceeds the major source threshold when the facility is operated at its maximum capacity continuously for 8,760 hr/yr. See Project Emissions section.

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 facility is not subject to a BACT analysis because the increases in particulate emissions caused by the removal of the fiberbed mist collector are below significant levels (see table below).

Pollutant	Emission Increases (TPY)[1] [1,200,000 TPY]	BACT Significant Levels (TPY)
CO	-	100
NO_X	-	40
SO_2	-	40
PM	0.63	25
PM-10	0.63	15
PM-2.5	0.63	-
VOC	-	40
Lead (Pb)	-	0.6
HAPs	0.023	-

[1] See attached emission calculation spreadsheets.

INSIGNIFICANT ACTIVITIES

Emergency Diesel Engine Generator
A 725 kW Caterpillar model 3412C TA generator is placed on site for use during power outages. The usage will not exceed 500 hours per any twelve-month (12-month) period. The generator is exclusively fired on fuel oil no. 2 and does not trigger a major source designation based on its potential to emit air pollutants (refer to permit application review no. 0522-01). The operation of this generator is identified as an insignificant activity under HAR 11-60.1-82(f)(5).

Storage Tanks
The facility utilizes six (6) aboveground storage tanks (ASTs) to contain asphalt cement supplies and diesel fuel. The ASTs are identified as insignificant sources under HAR 11-60.1-82(f)(1) for VOC storage with less than forty thousand (40,000) gallons of capacity as follows:

1. One (1) 10,000 gallon diesel fuel tank;
2. One (1) 6,000 gallon diesel fuel tank;
3. Two (2) 30,000 gallon asphalt cement tanks;
4. One (1) 31,040 gallon asphalt cement tank; and
5. One (1) 25,000 gallon working asphalt cement tank.

ALTERNATIVE OPERATING SCENERIOS

None proposed.

PROJECT EMISSIONS

Emissions from Drum Mixer Dryer

Emissions from the drum mixer dryer are estimated with emission factors from AP-42, Section 11.1 (3/04) – *Hot Mix Asphalt Plants* and based on the following conditions:

1. The drum mixer dryer is fired on fuel oil no. 2 or permitted alternate fuels at the maximum heat input capacity of 75 MMBtu/hr.
2. The maximum capacity of the drum mixer dryer is 300 TPH.
3. The HMA production limit is 1,200,000 TPY.
4. A baghouse is used to control particulate emissions from the drum mixer dryer.

Emission factors for firing fuel oil no. 2 are used to predict emissions for burning biodiesel and grease trap oil, except that nitrogen oxides (NO_X) emissions are increased by 10%. The 10% increase is 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.

Emissions are summarized in the table below.

Drum Mixer Dryer		
Pollutant	**Emissions (TPY)[1]**	
	1,200,000 TPY	**8,760 hr/yr**
CO	78.00	170.82
NO_X	36.30	79.50
SO_2	38.84	85.05
PM	19.80	43.36
PM_{10}	13.80	30.22
$PM_{2.5}$	13.20	28.91
VOC	19.20	42.05
Lead (Pb)	0.0090	0.020
HAPs	5.28	11.57

[1] See attached emission calculation spreadsheets.

Emissions from Silo Filling

Emissions from silo filling operations are estimated using emission factors from AP-42, Section 11.1 (3/04) – *Hot Mix Asphalt Plants*. A 1,200,000 TPY HMA production limit is used to determine emissions. Emissions are summarized in the table below.

Silo Filling		
Pollutant	**Emissions (TPY)[1]**	
	1,200,000 TPY	**8,760 hr/yr**
CO	0.71	1.55
NO_X	-	-
SO_2	-	-
PM	0.35	0.77
PM_{10}	0.35	0.77
$PM_{2.5}$	0.35	0.77
VOC	7.31	16.01
Lead (Pb)	-	-
HAPs	0.11	0.25

[1] See attached emission calculation spreadsheets.

Emissions from HMA Load-Out

Emissions from HMA load-out operations are estimated using emission factors from AP-42, Section 11.1 (3/04) – *Hot Mix Asphalt Plants*. A 1,200,000 TPY HMA production limit is used to determine emissions. Emissions are summarized in the table below.

HMA Load-out		
Pollutant	**Emissions (TPY)[1]**	
	1,200,000 TPY	**8,760 hr/yr**
CO	0.81	1.77
NO_X	-	-
SO_2	-	-
PM	0.31	0.69
PM_{10}	0.31	0.69
$PM_{2.5}$	0.31	0.69
VOC	2.35	5.14
Lead (Pb)	-	-
HAPs	0.052	0.11

[1] See attached emission calculation spreadsheets.

Emissions from Drop Operations at Aggregate Stockpiles

Particulate emissions from aggregate loading and load-out operations are estimated using emission factors from AP-42, Section 13.2.4 (11/06) – *Aggregate Handling and Storage Piles*. A 1,128,000 TPY aggregate throughput is assumed for the emission estimates based on the information from other Grace Pacific asphalt plants that 94% of the HMA is comprised of aggregate. A 70% control efficiency is assumed for use of water sprays. Emissions are summarized in the table below.

Aggregate Stockpiles – Drop Operations		
Pollutant	**Emissions (TPY)[1]**	
	1,128,000 TPY	**8,760 hr/yr**
PM	5.09	11.85
PM_{10}	2.41	5.60
$PM_{2.5}$	0.36	0.85

[1] See attached emission calculation spreadsheets.

Wind Erosion from Aggregate Stockpiles

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. A 70% control efficiency is assumed for use of water sprays. Emissions are summarized in the table below.

Aggregate Stockpiles – Wind Erosion	
Pollutant	**Emissions (TPY)[1]**
PM	0.096
PM_{10}	0.047
$PM_{2.5}$	0.0072

[1] See attached emission calculation spreadsheets.

Emissions from Aggregate Handling

Particulate emissions from scalping screens are estimated using AP-42, Section 11.19.2 (8/04) – *Crushed Stone Processing and Pulverized Mineral Processing*. A 1,128,000 TPY aggregate

throughput is assumed for the emission estimates. A 70% control efficiency is assumed for use of water sprays. Emissions are summarized in the table below.

Aggregate Handling		
Pollutant	**Emissions (TPY)[1]**	
	1,128,000 TPY	**8,760 hr/yr**
PM	1.52	3.53
PM_{10}	0.52	1.20
$PM_{2.5}$	0.056	0.13

[1] See attached emission calculation spreadsheets.

Emissions from Vehicle Travel on Unpaved Roads

Particulate emissions from vehicle travel on unpaved roads are estimated using AP-42, Section 13.2.2 (11/06) – *Unpaved Roads*. A 70% control efficiency is assumed for use of water spray. A 4,000 hr/yr operating limit (equivalent to the 1,200,000 TPY HMA production limit) is assumed for the emission estimates. Emissions are summarized in the table below.

Unpaved Roads		
Pollutant	**Emissions (TPY)[1]**	
	4,000 hr/yr	**8,760 hr/yr**
PM	10.95	23.98
PM_{10}	2.68	5.86
$PM_{2.5}$	0.27	0.59

[1] See attached emission calculation spreadsheets.

Total Facility Emissions

Facility-wide emissions are summarized in the table below.

Pollutant	**Total Emissions (TPY)[1]**	
	1,200,000 TPY	**8,760 hr/yr**
CO	79.52	174.14
NO_X	36.30	79.50
SO_2	38.84	85.05
PM	38.11	84.28
PM_{10}	20.11	44.39
$PM_{2.5}$	14.55	31.95
VOC	28.86	63.20
Lead (Pb)	0.0090	0.020
HAPs	5.45	11.93

[1] See attached emission calculation spreadsheets.

Greenhouse Gas (GHG) Emissions

Total GHG emissions on a CO_2 equivalent (CO_2e) using the global warming potential (GWP) of the GHG are summarized in the table below.

GHG	GWP	GHG CO_2e Based Emissions (TPY)	
		1,200,000 TPY	8,760 hr/yr
Carbon Dioxide (CO_2)	1	19,800.0	43,362.0
Methane (CH_4)	25	184.5	404.3
Nitrous Oxide (N_2O)	298	84.8	185.6
	Total Emissions	20,069.3	43,951.9

[1] 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. Although there is an increase in PM emissions from silo-filling and load-out activities due to the removal of the fiberbed mist collector, an AAQA is not conducted for this renewal because the Department of Health air modeling guidance does not require that for fugitive emissions. See permit application review no. 0522-01 for AAQA results.

SIGNIFICANT PERMIT CONDITIONS

The operational limits and monitoring/recordkeeping requirements for the fiberbed mist collector are removed from the permit. All other significant conditions remain the same as in the permit issued on August 29, 2008.

CONCLUSION

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

Jing Hu
November 24, 2014