PROPOSED
Reviewed by: MR
November 26, 2003

Permit Application Review for an Amendment to Temporary Covered Source Permit (NSP) No. 0045-02-CT

File #: 0045-12 for a Minor Modification

Applicant: Grace Pacific Corporation

Facility Title: 334 TPH (Makakilo) Hot Mix Asphalt Facility

Location : 91-920 Farrington Highway
Kapolei, Oahu

UTM Coordinates provided by applicant: 596703 m E, 2361730 m N
SICC: 2951

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Equipment Description:

The current covered source permit encompasses the following equipment and associated appurtenances:

1. 725 kW Caterpillar diesel engine generator, de-rated to 75% of full load
2. Drum-Mixer, Astec Six Pack Asphalt Plant with baghouse
3. RAP crushing and screening system
4. Various conveyor belts

A 1.5 MMBtu/hr Hot Oil Heater, Heatec HCS-100 previously permitted was determined exempt with the March 5, 2002 permit amendment. (See permit amendment and technical review located in the file folder).

Proposed Project:

Background:
Grace Pacific Corporation currently operates a hot drum-mix asphalt facility located at Grace Pacific's Makakilo Quarry in Kapolei, Oahu. The facility consists of a 334 ton per hour Drum-Mix Asphalt Concrete Batch Plant, Diesel Engine Generator, and RAP crushing and screening system. The facility is currently permitted under Covered Source Permit (CSP) No. 0045-02-CT issued on May 3, 2000, and amended on March 5, 2002 and May 10, 2002 (replacement of RAP lumpbreaker with RAP crusher and screener).

Process:
Virgin aggregate (84.5%), recycled asphalt paving (RAP) (9.5%), and liquid asphalt cement (6%) are the three ingredients used to produce the asphalt. Virgin aggregate is received via belt conveyor from the adjacent Grace Pacific quarry, is stored in stockpiles, and transferred to the cold feed storage bins by front end loader. The aggregate travels by conveyors to a vibrating scalping screen and then to the drum-mixer. RAP is transferred from stockpiles into a recycle bin via front end loader and travels to the crushing and screening system and then to the drum-mixer via conveyor. Liquid asphalt is added to the RAP and aggregate in the drum-mixer and the finish product is discharged from the drum-mixer onto a conveyor. From this conveyor, the finish product is transferred to storage bins for truck loading.

Proposal:
Grace Pacific Corporation is proposing to amend their existing covered source permit, No. 0045-02-CT, to include the use of a blend of fuel oil no. 2 and specification used oil with a maximum sulfur content not to exceed 0.5% by weight in the existing drum-mixer. The proposed change would allow both 100% fuel oil no. 2 and the blended fuel oil to be used in the existing drum-mixer. The blended fuel oil will consist of, at most, 25% specification used oil. The blended fuel will be agitated during blending, and before and during burning to assure a well-mixed blend. A tank shall be designated to store specification used oil at the facility. An existing tank (with agitator) shall be used for the blending. Another existing tank shall continue to store the fuel oil no. 2 for the drum mixer (the remaining fourth tank stores fuel oil no. 2 for the diesel engine generator). The following constituents/properties of the specification used oil shall not exceed the specified limits listed below:

Constituent/Property	Allowable Limit
Arsenic	5 ppm maximum
Cadmium	2 ppm maximum
Chromium	10 ppm maximum
Lead	100 ppm maximum
Total Halogen	1,000 ppm maximum
Sulfur	0.5% maximum by weight
Flash Point	100°F minimum
Polychlorinated Biphenyls (PCB)	< 2 ppm

Records shall be kept including the date and result of any testing for the specification used oil, dates of blending, amount of each fuel blended, and total amount of fuel blended. For each time fuel is blended, Grace Pacific Corporation proposes stick readings of the fuel blend tank to monitor the amount of each fuel blended and combusted by the drum mixer/dryer. A flow meter is also used to quantify the amount of fuel burned in the drum mixer/dryer. Dipstick readings of the blend tank (after each fuel added) will also ensure that the 25% specification used oil limit in the blend is not exceeded.

The proposal is to burn a maximum of 20,000 gallons of specification used oil in the drum-mixer. These 20,000 gallons of specification used oil would replace 20,000 gallons of fuel oil no. 2. There would be no increase in the production, hours of operation, or total fuel consumption. The specification used oil will consist only of specification used oil from Unitek Solvent Services and sources within Grace Pacific Corporation. The amount of specification used oil is based on the amount of Grace Pacific generated used oil sent to Unitek for processing/testing and then repurchased. The applicant intends to eventually test their own generated used oil, but does not have this in place at this time. Should the applicant desire to burn specification used oil from any other sources, they shall provide written notification and receive approval from the Department prior to burning of this fuel.

All other operational limitations will remain unchanged.

The equipment located at the facility will remain unchanged.

There are no other changes proposed for this source.

The application fee for a covered source permit minor modification of $100.00 was processed.

Air Pollution Controls:

Air pollution control is achieved through the current use of fuel oil no. 2 with a maximum sulfur content not to exceed 0.5% in the drum-mixer and generator and the proposed use of a blend of fuel oil no. 2 and specification used oil with a maximum sulfur content not to exceed 0.5% in the drum-mixer. The existing drum-mixer also currently utilizes a baghouse.

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
  - Subchapter 8, Standards of Performance for Stationary Sources
    - 11-60.1-161(9) Standards of Performance for Asphalt Concrete Plants
  - Subchapter 10 - Field Citations

This existing source is subject to **NSPS**. It falls under:
- 40 CFR Part 60, Subpart A (General Provisions)
- 40 CFR Part 60, Subpart I (Standards of Performance for Hot Mix Asphalt Facilities) because construction or modification was commenced after June 11, 1973.

This source is not subject to **PSD** requirements because it is not a major stationary source.

This source is not subject to **NESHAPS** as there are no standards in 40 CFR Part 61 applicable to hot mix asphalt facilities and it is not a major source of HAPs.

This source is not subject to **MACT** as the facility is not a major or area source of HAPS, covered under 40 CFR Part 63.

40 CFR Part 64
The purpose of Compliance Assurance Monitoring (**CAM**) is to provide reasonable assurance that compliance is being achieved with large emission units that rely on air pollution control device equipment to meet an emissions limit or standard. 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 precontrol emissions that are greater than the major source level; and (5) not otherwise be exempt from CAM. The facility remains exempt from all Compliance Assurance Monitoring (CAM) provisions because this source is not a major source.

Synthetic minor applicability: A "synthetic minor" is a facility that, without limiting conditions (physical or operational), emits above the "major" triggering levels (as defined by HAR 11-60.1-1) for either criteria pollutant(s) or hazardous air pollutant(s). This facility remains a synthetic minor being that it will emit above the "major" triggering levels without controls or limitations. (See spreadsheets for details on current calculations and File No. 0045-02 for details on previous calculations.)

A Best Available Control Technology (**BACT**) analysis is required for new sources or modifications to existing sources that would result in a net significant emission increase as defined in HAR, Section 11.60.1-1. Emissions shown in Table 1 represent the worst case emissions from operation of the drum-mixer firing fuel oil no. 2 or the proposed oil no.2 and specification used oil blend at the 20,000 gallons/year specification used oil operational limitation. Future potential calculated emissions of the drum-mixer (without even considering any decrease from past actual emissions) are less than significant. Therefore, this modification does not result in a net significant emission increase and a BACT analysis was not performed at this time.

TABLE 1: BACT CALCULATION COMPARISON WITH SIGNIFICANT LEVELS

POLLUTANT	Future Potential Drum Mixer Emissions (TPY) (20,000 gallons/year specification used oil)	Significant Levels (TPY)	
SO_2	0.62	<	40
NOx	0.37	<	40
CO	0.87	<	100
PM	0.22	<	25
PM_{10}	0.15	<	15
VOC	0.21	<	40
Lead	1.00e-04	<	0.6
Mercury	1.73e-05	<	0.1

Future potential values as shown above are for the worst case calculated emissions from the firing of fuel oil no. 2 or a blend of fuel oil no. 2 and specification used oil. The highest value is shown above.

The applicant's proposal included burning of both fuel oil no. 2, and a blend of fuel oil no. 2 with specification used oil (25% spec used oil max) in the drum-mixer. Calculations were performed for the drum-mixer firing both fuel oil no. 2 and a blend of fuel oil no.2 and specification used oil with the operational limit of 20,000 gallons/year to determine the worst case emissions from the drum mixer. Calculated worst case emissions were determined to be from the drum mixer firing the blended fuel.

CER and CDS applicability:

40 CFR Part 51, Subpart A - Emission Inventory Reporting Requirements, determines CER based on facility wide emissions of each air pollutant at the CER triggering levels as shown in the table below.

Pollutant	CER Triggering Levels (tpy)	In-house Total Facility Triggering Levels (tpy)
NO_x	≥100	≥25
SO_x	≥100	≥25
CO	≥1000	≥250
PM_{10}	≥100	≥25 (for PM also)
VOC	≥100	≥25
Pb	≥ 5	≥5

This facility does not have any emissions at the CER triggering levels. Therefore, CER requirements are not applicable.

Although CER for the facility is not triggered, the Clean Air Branch requests annual emissions reporting from those facilities that have facility-wide emissions of a single air pollutant exceeding in-house triggering levels. Annual emissions from these facilities are used within the Department and are not inputted into the AIRS database. Total combined facility emissions exceed the in-house triggering level for NOx (38.41 > 25 tons/yr), SO_2 (28.64 > 25 tons/yr), and CO (41.36 > 25 tons/yr) therefore, annual emissions is required for in-house recordkeeping purposes. Per File No. 0045-02, this facility is already subject to this reporting requirement.

Insignificant Activities/Exemptions:

Besides the designation of a specification used oil tank (<10,000 gallons) there are no changes to the insignificant activities/exemptions for the facility. Existing insignificant activities at the facility consist of the following:

1) Two above ground fuel oil no. 2 storage tanks (4,000 and 3,000 gallon capacities) and one 10,000 gallon fuel oil tank.
2) Two 30,000 gallon above ground liquid asphalt cement storage tanks (AR-6000).
3) A 6,000 gallon cold mix tank.

These storage tanks and the future specification used oil tank are exempt from the air permit requirements per HAR, Section 11-60.1-82(f)(a). The tanks have a capacity of less than 40,000 gallons and are not subject to any standard or other requirement pursuant to Section 111 or 112 of the CAA.

The tanks are not subject to NESHAPS as there are no standards in 40 CFR Part 61 applicable to these fuel tanks.

These tanks are not subject to NSPS as there are no applicable regulations in 40 CFR Part 60 pertaining to these fuel tanks. They do not fall under Subpart K, Subpart Ka, or Subpart Kb being that each tank capacity is less than 40,000 gallons, the fuel and cold mix tank capacities do not exceed the minimum capacity ($40m^3$) for NSPS Subpart Kb, and the asphalt cement has a vapor pressure less than 0.5 psi.

Alternative Operating Scenarios:

No new alternate operating scenarios are proposed. The current covered source permit alternative operating scenarios allows the operation of a similar or equivalent generator should the existing generator need replacement.

Project Emissions:

The emissions calculations provided for the drum-mixer on Forms S-1 were checked using the most current AP-42 Hot Mix Asphalt Plant factors (12/00), and Fuel Oil (9/98) and Waste Oil (10/96) Combustion factors for SO_2. The previous AP-42, Section 11.1 (1/95), Hot Mix Asphalt Plants, did not contain individual emission factors for fuel oil no. 2 and specification used oil. Instead, it provided averaged emission factors based on emission tests using various fuels (No. 2, 4, 5, and waste oil) for a combined category of oil fired dryers. The most current AP-42, Section 11.1 (12/00) identifies separate emission factors for fuel oil no. 2 and waste oil (and other types of fuels). The current AP-42, more specifically defines the emissions of the different fuels. The current AP-42 background document for this section which provides summaries of test data and emission factors for drum mix dryers for different fuels and types of controls was also referenced to determine the types of controls utilized and if RAP was included in the tests performed in the development of the emission factors.

The asphalt plant AP-42 emission factors were not used for determining SO_2 emissions, as the factors did not incorporate a fuel sulfur content in the calculation. As the sulfur content of the fuels tested to determine these AP-42 emission factors may not be reflective of the proposed

and current fuels used at the facility, it was decided that SO_2 emissions based on fuel usage and the fuel combustion emission factors (for the appropriate fuels) presented in AP-42, Chapter 1, would result in a more representative determination of SO_2 emissions from either of the facility's fuels. Use of this method is specified per note c of Table 11.1-7 of the Hot Mix Asphalt Plant section of the AP-42 and considers the sulfur content of the fuels in determining the SO_2 emissions.

PM and PM_{10} emissions conservatively compared emissions using source test results for the existing conditions and AP-42 emission factors for the proposed conditions. Comparison of AP-42 calculated emissions for both existing and proposed conditions shows no increase in PM and $PM_{10.}$ In addition, Table 11.1-3, Note g of the Hot Mix Asphalt section of the AP-42 states that the data indicate that fuel type does not significantly effect PM emissions.

Waste oil emission factors were used in determining emissions from the specification used oil. Tests for certain pollutants (i.e., metals, acetaldehyde, acrolein, benzene, etc.) were only conducted for the burning of waste oil or propane, see Enclosures (1) and (2) for details. Emission factors developed utilizing tests with fabric filter control and RAP were also noted in Enclosures (1) and (2).

The data below summarize the Department of Health's emission calculations, performed in Enclosures (1) and (2). Worst case emissions from the drum-mixer were calculated assuming the burning of both 100% fuel oil no. 2 and a blend of fuel oil no. 2 and specification used oil with the production limit of 540,000 tons/yr. The worst case (larger) emissions of the two scenarios were used to calculate totals for the facility.

The drum-mixer emissions were based on a 334 TPH maximum production rate. Detailed calculated emissions from the drum-mixer firing the blended fuel are shown in Enclosure (1) (shows 100% specification used oil). Detailed calculated emissions from the drum-mixer firing 100% fuel oil no. 2 are shown in Enclosure (2).

Past actual drum-mixer emissions were not required for the BACT determination being that future potential emissions from the modification did not result in a significant increase and thus past actual emission were not calculated.

Table 2 provides an emissions summary comparison of the Drum Mixer burning fuel oil no. 2 (existing fuel permit condition) and the worst case of either burning fuel oil no. 2 or a blend of fuel oil no. 2 and specification used oil. Table 3 provides an emissions summary for the proposed modification. Table 4 provides an emissions summary of HAPs and other trace elements/speciated organic compounds for the proposed modification. Please refer to the attached spreadsheets for details.

TABLE 2: DRUM MIXER EMISSIONS PROPOSED VS. EXISTING COMPARISON SUMMARY[a]

Air Pollutant	Proposed Condition: Fuel Oil No. 2 or Spec. Oil/Fuel Oil No. 2 Blend		Existing Condition: Fuel Oil No. 2		Change	
	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
Criteria Pollutants						
SO_2[b]	30.94	0.62	30.83	0.62	0.11	0.00
NOx	18.37	0.37	18.37	0.37	0.00	0.00
CO	43.42	0.87	43.42	0.87	0.00	0.00
PM[c]	5.26 (AP-42 based)	0.22 (AP-42 based)	3.34 (source test based)	0.07 (source test based)	1.92 (0.00 using AP-42 only)	0.15 (0.00 using AP-42 only)
PM_{10}[c]	4.43 (AP-42 based)	0.15 (AP-42 based)	3.34 (source test based)	0.07 (source test based)	1.09 (0.00 using AP-42 only)	0.08 (0.00 using AP-42 only)
VOC	10.69	0.21	10.69	0.21	0.00	0.00
Lead	5.01e-03	1.00e-04	5.01e-03	1.00e-04	0.00	0.00
Other Pollutants (for which there was a change in calculated emissions)						
Acetaldehyde	0.1086	8.67e-03	NEF	NEF	0.1086	8.67e-03
Acrolein	2.17e-03	1.73e-04	NEF	NEF	2.17e-03	1.73e-04
Methyl Ethyl Ketone	1.67e-03	1.33e-04	NEF	NEF	1.67e-03	1.33e-04
Propionaldehyde	1.09e-02	8.67e-04	NEF	NEF	1.09e-02	8.67e-04
Quinone	1.34e-02	1.07e-03	NEF	NEF	1.34e-02	1.07e-03
HCL	1.75-02	1.40e-03	NEF	NEF	1.75-02	1.40e-03

NEF = No emission factor provided.

[a] Calculated emissions were based on the production limit of 20,000 gallons/year for both existing and proposed conditions based on the AP-42 and source performance tests. All other calculated emissions not shown above, exhibited no change with the proposed switch in fuels. See enclosures for detailed calculations.

[b] SO_2 emissions were calculated based on Note c of AP-42, Table 11.1-7 which states that emissions of SO_2 can also be estimated based on fuel usage and the fuel combustion emission factors for the appropriate fuels. The SO_2 calculations were based on this being that the Hot Mix Asphalt Section of the AP-42 (as presented in Table 11.1-7) does not provide a parameter for varying sulfur contents in fuels, but rather averaged SO_2 emission factors derived from multiple tests and fuel types. Using fuel combustion emission factors from the AP-42 allows the incorporation of the appropriate sulfur contents of the current and proposed fuels.

[c] PM and PM_{10} emissions as shown above, conservatively compared emissions using source test results (March 16, 1995 used as the testing performed in 1998 and 2000 showed larger numbers and would result in a smaller difference in emissions before and after the proposed modification) for the existing conditions (fuel oil no. 2) and AP-42 emission factors for the proposed conditions (blended fuel oil and specification used oil). Comparison of AP-42 calculated emissions for both existing and proposed conditions shows no increase in PM and PM_{10}. In addition, Table 11.1-3, Note g of the AP-42 states that the data indicate that fuel type does not significantly effect PM emissions.

Emissions shown considering both fuel oil no. 2 only and the proposed blend of fuel oil with a maximum of 25% specification used oil. (i.e., for the blended fuel, SO_2 emissions, lb/hr = (31.27 + (30.83 x 3))/4 = 30.94 lb/hr.)

TABLE 3: FACILITY EMISSIONS SUMMARY
MAXIMUM EMISSIONS COMPARED TO CER, In House & CDS Levels

Pollu-tant	Drum Mixer Emissions (540,000 ton/yr) (TPY)	RAP Crush-ing & Screen-ing System (216,000 ton/yr) (TPY)*	Material Convey-ing Emissions (540,000 ton/yr) (TPY)*	Generator Emissions (107,460 gal/yr) (TPY)*	Total Emissions (TPY)	CER Levels TPY	In House/ CDS Levels TPY	Insig-nificant Activities (Hot Oil Heater)* (8,760 hrs/yr) TPY	TOTAL Emissions Including Insignifi-cant Activities TPY
SO_2	24.92	0.00	0.00	3.72	**28.64**	100	25/100	0.15	28.79
NOx	14.85	0.00	0.00	23.56	**38.41**	100	25/100	1.41	39.82
CO	35.10	0.00	0.00	6.26	**41.36**	1000	25/1000	0.76	42.12
PM	2.85**	1.75	3.38	5.13E-01	8.49	-	25/100	0.07	8.56
PM_{10}	2.78**	0.84	1.66	4.22E-01	5.70	100	25/100	0.04	5.74
VOC	8.64	0.00	0.00	6.62E-01	9.30	100	25/100	0.05	9.35
Lead	4.05e-03	0.00	0.00	0.00	4.05e-03	5	5/5	4.51e-06	4.05e-03

* Being that there were no changes proposed which would affect RAP crushing and screening system, material conveying, the hot oil heater, and generator, calculated emissions from these sources were obtained from File No. 0045-02.
The hot oil heater values shown above are reflective of the worst case from either LPG or SNG firing.
The material conveying emissions are conservative, as considered emissions prior to March 25, 2002 RAP amendment and added emissions from the RAP crushing and screening system which was added in that amendment. Being that the asphalt production limit (540,000 tons/yr) remained in effect, an increase in RAP usage would result in a corresponding decrease of virgin aggregate usage, and thus, there would be a decrease in emissions from material conveying (i.e., screening and conveying of aggregate) shown above.
** Emissions consider using 20,000 gallons/year of specification used oil (equivalent to 13,333 TPY of asphalt production) and the remaining run time using fuel oil no. 2 (equivalent to 526,667 tons/yr asphalt production). For the run time using fuel oil no. 2, emissions were calculated using source test results (if available). For the run time using specification fuel oil, emissions were conservatively calculated using AP-42 emission factors. Emissions for the other pollutants are the same for fuel oil no. 2 or specification used oil.
Note: AP-42 emission factors were updated since the last time emissions were calculated from the drum-mixer (as shown in previous reviews in the file folder).

TABLE 4: EMISSIONS SUMMARY FOR HAZARDOUS AIR POLLUTANTS (HAPS)

POLLUTANT	Drum-Mixer Emissions (540,000 tons/yr) (TPY)	Generator Emissions (107,460 gal/yr) (TPY)**	Hot Oil Heater Emissions (8,760 hr/yr) (TPY)**	TOTALS (TPY)
2-Methylnaphthalene*	4.59e-02	ND	2.16e-07	4.59e-02
Acenaphthene*	3.78e-04	ND	5.33e-08	3.78e-04
Acenaphthylene*	5.94e-03	ND	2.01e-08	5.94e-03
Acetaldehyde*, ***	8.67e-03	0.00	ND	8.67e-03
Acrolein*,***	1.73e-04	0.00	ND	1.73e-04
Anthracene*	8.37e-04	ND	2.16e-08	8.37e-04
Benzene*	1.05e-01	6.00e-03	1.89e-05	1.11e-01
Benzo(a)anthracene*	5.67e-05	ND	1.62e-08	5.67e-05
Benzo(a)pyrene*	2.65e-06	ND	1.08e-08	2.65e-06
Benzo(b)fluoranthene*	2.70e-05	ND	1.62e-08	2.70e-05
Benzo(e)pyrene*	2.97e-05	ND	ND	2.97e-05
Benzo(g,h,i)perylene*	1.08e-05	ND	1.08e-08	1.08e-05
Benzo(k)fluoranthene*	1.11e-05	ND	1.62e-08	1.11e-05
Chrysene*	4.86e-05	ND	1.62e-08	4.86e-05
Ethylbenzene*	6.48e-02	ND	ND	6.48e-02
Fluoranthene*	1.65e-04	ND	2.71e-08	1.65e-04
Fluorene*	2.97e-03	ND	2.52e-08	2.97e-03
Formaldehyde *	8.37e-01	1.00e-03	6.76e-04	8.38e-01
Hexane*	2.48e-01	ND	1.62e-02	2.48e-01
Indeno(1,2,3-cd)pyrene*	1.89e-06	ND	1.62e-08	1.89e-06
Isooctane (2,2,4-trimethylpentane)*	1.08e-02	ND	ND	1.08e-02
Methyl chloroform*	1.30e-02	ND	ND	1.30e-02
Methyl ethyl ketone*,***	1.33e-04	ND	ND	1.33e-04
Naphthalene*	1.76e-01	1.00e-03	5.50e-06	1.77e-01
Perylene*	2.38e-06	ND	ND	2.38e-06

Phenanthrene*	6.21e-03	ND	4.93e-07	6.21e-03
Propionaldehyde*,***	8.67e-04	ND	ND	8.67e-04
Propylene*	ND	2.10e-02	ND	2.10e-02
Pyrene*	8.10e-04	ND	4.51e-08	8.10e-04
Quinone*,***	1.07e-03	ND	ND	1.07e-03
Toluene*	7.83e-01	2.00e-03	3.07e-05	7.85e-01
Xylene*	5.40e-02	1.00e-03	ND	5.50e-02
Antimony*	4.68e-05	ND	ND	4.68e-05
Arsenic*	1.51e-04	ND	1.80e-06	1.51e-04
Beryllium*	0.00e+00	ND	1.08e-07	0.00e+00
Cadmium*	1.11e-04	ND	9.92e-06	1.11e-04
Chromium*	1.48e-03	ND	1.26e-05	1.48e-03
Cobalt*	7.02e-06	ND	7.57e-07	7.02e-06
Hexavalent chromium*	1.22e-04	ND	ND	1.22e-04
Lead*	4.05e-03	ND	4.51e-06	4.05e-03
Manganese*	2.08e-03	ND	3.43e-06	2.08e-03
Mercury*	7.02e-04	ND	2.34e-06	7.02e-04
Nickel*	1.70e-02	ND	1.89e-05	1.70e-02
Phosphorus*	7.56e-03	ND	ND	7.56e-03
Selenium*	9.45e-05	ND	2.16e-07	9.45e-05
PCDD/PCDF*	3.24e-08	ND	2.31e-11	3.24e-08
3-Methylchloranthrene*	ND	ND	1.62e-08	1.62e-08
7,12-Dimethylbenz(a)anthracene*	ND	ND	1.44e-07	1.44e-07
Dibenzo(a,h)anthracene*	ND		1.08e-08	1.08e-08
Dichlorobenzene*	ND	ND	1.08e-05	1.08e-05
HCL*,***	3.07e-01	ND	ND	3.07e-01
TOTAL HAPS	2.71	3.20e-02	1.70e-02	2.76

ND = no emission factors identified.
* = hazardous air pollutants listed in the Clean Air Act
** Being that there were no changes proposed which would affect the hot oil heater or the generator, calculated emissions from these sources were obtained from File No. 0045-02.

*** Acetaldehyde, Acrolein, Methyl Ethyl Ketone, Propionaldehyde, Quinone, and HCL emissions specified in the AP-42 for waste oil only. Therefore, emissions for these pollutants based on the proposed 20,000 gal/yr limit for specification used oil. Emissions for other HAPs shown above consider 540,000 tons/yr limit and are the same for fuel oil no. 2 and specification used oil. Note: AP-42 emission factors were updated since the last time HAPs were calculated from the drum-mixer (as shown in previous reviews in the file folder).

A major source as defined in Section 11-60.1-1 of HAR Title 11, has the potential to emit any HAP of 10 TPY or more, or 25 TPY or more of any combination of HAPs, or 100 TPY or more of any air pollutant. Calculated emissions do not meet these limits and thus, this facility is not classified as a major source.

Air Quality Assessment:

The ambient air quality standards seek to protect public health and welfare and to prevent the significant deterioration of air quality. For new facilities and facilities proposing modifications, an ambient air quality assessment is required to analyze the maximum potential pollutant concentrations generated by a source and it's effect on the ambient air.

This facility is proposing a minor modification with its request to substitute up to 20,000 gallons/year of specification used oil in place of the fuel oil no. 2 used in the drum-mixer. The potential changes in emissions are presented in Table 2. The only pollutant affected from the previously performed modeling would be SO_2. Although the change in the short term SO_2 emission rate with the proposed change would be very small:

> 3.94 g/sec (spec used oil) - 3.88 g/sec (fuel oil no. 2) = a change of less than 0.06 g/sec (actual change will be less as only 25% at maximum, of the fuel being burned will be specification fuel oil, considering this limit, the change would be 0.02 g/sec),

the previous modeling utilized a SO_2 short term emission rate based on an AP-42 emission factor that did not consider the actual sulfur content of the fuel, but rather averaged SO_2 emission factors derived from multiple tests and fuel types. As the emission rate used in the previous modeling was lower when compared to the rate calculated considering fuel combustion and the appropriate sulfur content of the actual fuels (see spreadsheet), the SO_2 air quality analysis was re done to verify compliance with the air quality standards.

Remodeling and air quality assessments for the other pollutants were not performed, as the only other short term emission rate which could have affected previous modeling results is PM-10. Remodeling for PM-10 was not determined to be necessary as:

1) The previous modeling conservatively used a higher PM-10 emission rate (1.31 grams/sec), than both the source test results and current AP-42 emission factor determined rates shown in Table 2. As the previous modeling (using the higher

emission rate) demonstrated compliance with the ambient air quality standards, use of either of the lower emission rates (0.42 grams/sec, based on source testing or 0.97 grams/sec based on the current AP-42 emission factors, 100% used oil) in the modeling analysis would also demonstrate (with a wider margin) compliance with the air quality standards. In addition,

2) PM and PM_{10} emissions as shown above, conservatively compared emissions using source test results (March 16, 1995) for the existing conditions and AP-42 emission factors for the proposed conditions. Comparison of AP-42 calculated emissions for both existing and proposed conditions shows no increase in PM and PM10. Table 11.1-3, Note g of the AP-42 states that the data indicate that fuel type does not significantly effect PM emissions.

MODEL SELECTION AND ASSUMPTIONS
The USEPA Industrial Source Complex Short Term 3 (ISCST3) refine model was used to quantify the emission impacts on ambient air quality. Air quality modeling assumptions and application of the model followed guidance from 40 CFR Part 51, Appendix W, Guideline on Air Quality Models and the model user's guide. The ISCST3 model (USEPA 1995) was selected because it has options to address building wake effects; predict impacts in simple terrain, intermediate terrain and complex terrain; and utilize sequential hourly meteorological data. The ISCST3 model also contains regulatory default options which were used in this analysis to determine the concentration impacts. The following default options are implemented by the model:

- Stack tip downwash except for Schulman-Scire downwash;
- No gradual plume rise except for wake effects;
- Buoyancy-induced dispersion except for Schulman-Scire downwash;
- Calm processing;
- Default rural wind profile exponents; and
- Default vertical potential temperature gradients.

METEOROLOGY
The data base used with ISCST3 consisted of sequential hourly meteorological data collected at the AES/Barbers Point monitoring station and twice daily mixing height data recorded at the Lihue Airport, Kauai. The period of record for both data bases was calendar year 1992. The meteorological data was in a preprocessed binary form. The binary file was converted to an ASCII format and used with the model.

GOOD ENGINEERING PRACTICE STACK HEIGHT AND WAKE EFFECTS
The U.S. EPA provides specific guidance for determining Good Engineering Practice (GEP) stack height and for determining whether building wake effects will occur (U.S. EPA 1985). According to the USEPA guidance document, GEP stack height is defined as the height of a nearby structure plus one-half times the height or projected width of the structure, whichever is less. In the event that a physical stack height is less than the GEP formula stack height, the building wake effects on ground level pollutant concentrations should be evaluated.

Table 5 lists the nearby structures that could cause building wake effects. The building information as well as the emission source information listed in the Emissions Units Table were entered into the USEPA Building Profile Input Program (BPIP) (USEPA 1993) to determine the greatest GEP stack height for each source and to define the structure that gives the greatest GEP stack height at every ten degree increment. The results were imported into ISCST3 so that the model can predict concentration impacts under a wake effect situation.

EMISSION SOURCES AND RATES
The SO_2 emission rate and stack parameters presented in Table 6 were used in the analysis.

RECEPTOR GRID AND TERRAIN
A cartesian coordinate system was used to define the modeling domain. A modeling grid of 30 meters was used expanding out approximately 500 meters in the north, south, east, and west directions from the stack. Property line receptors were also used and were spaced at about 50 meters in the modeling.

Terrain heights were also used with each receptor location. The terrain heights for receptor points used in the coarse grid were obtained from digitized U.S. Geological Survey 7.5 minute quadrangles of the area. The 30 meter refined grid was determined from GPS readings and elevations interpolated off the USGS maps. The applicant had previously utilized a surveyor to take GPS measurements at 50-meter intervals along the plant boundaries to increase the accuracy of the plant boundary nodes.

TABLE 5: GEP ANALYSIS

Bldgs / Structures	Hb Hght (ft)	Length (ft)	Width (ft)	Dist to stack (Drum-Mixer) (ft)
Cold Feed Bins (4)[a]	45	50	9	60
Drum Mixer	15	40	10	0
Baghouse	25	40	12	15
Silos (4)[a]	60	23	23	20
Diesel Gen.	12	4	2	20
A. C. Storage Tank (2)[a]	14	50	28	20
3,000 gal F. O. Tank[b]	5	24	5	20
4,000 gal F. O. Tank[b]	6	13	6	26
10,000 gal Spec Oil Tank[b]	8	27	8	28
Recycle Bin	10	10	10	24
Plant Office/ Control House	15	35	16	130
6,000 gal Cold Mix Tank[b]	12	17	12	95

[a] Buildings/structures are combined.
[b] Height dimension is diameter (tanks are lying on their sides).
Recently added RAP crushing/screening equipment are less than 40% of stack height.

TABLE 6: SOURCE EMISSION RATES AND STACK PARAMETERS FOR AIR MODELING

Source	Emission Rates	Stack Parameters			
Equipment	SO_2 (g/s)	Height (m)	Temp (K)	Velocity (m/s)	Diameter (m)
Drum-Mixer Burning Spec Used Oil	3.94 (100% spec)	10.67 (35 ft)	351.46	12.24	1.18

Gram per second emission rate based worst case emissions from the drum-mixer firing fuel oil no. 2 and the blended fuel. (See Enclosures (1) and (2)). Conservatively did not account for maximum of 25% specification used oil in the blend. Other stack parameters remain unchanged from File No. 0045-02.

MODELING RESULTS AND CONCLUSIONS
A summary of the results of the air modeling and the ambient air quality analysis are shown in Table 7. The model predicted concentrations are presented in Enclosure (3). The current CSP operational daily limitation of 20 hours/day and annual operating restriction of 540,000 tons/yr was applied.

TABLE 7: SO_2 PREDICTED AMBIENT AIR QUALITY IMPACTS

POLLU-TANT	AVER. TIME	IMPACT ($\mu g/m^3$)	Back-ground ($\mu g/m^3$)	TOTAL IMPACT ($\mu g/m^3$)	SAAQS ($\mu g/m^3$)	Percent of Standard
SO_2	3-hr	1130	30	1160	1300	89.23%
	24-hr*	256	7	263	365	72.05%
	Annual**	14	2	16	80	20.00%

Notes: (Model conc) x (Potential emissions) = Potential Ambient Air Impact
For Potential emissions (g/s), see Enclosures (1) and (2).
*Drum mixer/dryer limited to 20 hours/day operations.
**Production limited to 540,000 tons/yr. Applied annual factor:
(540,000 tons/yr) / (334 tons/hr) x (8,760 hr/yr) = 0.185
Conservatively assumed all hours of operation burning 100% specification used oil only (with a higher SO_2 short term emission rate) and did not apply 20,000 gallon restriction.

1999-2001 Hawaii Air Quality Data (DOH/CAB) was utilized for background concentrations. Hour values represent the highest value for the year. Background concentrations for all pollutants are from the DOH Kapolei monitoring site. The highest value of the three years of data was used (less values due to New Years fireworks).

State Ambient Standards are stricter than National; therefore, only State Standards are listed.

The existing diesel engine generator was previously permitted with no changes, and air quality assessments were done in concurrence with the processing of the previous permit application. The facility is not proposing any modifications to the diesel engine generator. Therefore an air quality analysis for the diesel engine generator was not performed at this time.

The combined effect of 1) maximum concentrations generated by the drum-mixer firing fuel oil no. 2 or blended fuel oil no.2 and specification used oil and 2) ambient background concentrations, demonstrate compliance with the State Ambient Air Quality Standards and National Ambient Air Quality Standards.

There are no changes proposed for any of the facility's other equipment and air quality assessments were done in concurrence with the processing of the previous permit application and amendments. Therefore air quality analyses for these units were not performed at this time.

Significant Permit Conditions:

Existing
The following significant permit conditions were conditions of the CSP 0045-02-CT and have not been modified:

- The generator is limited to 107,460 gallons of fuel in any rolling 12 month period.
- The asphalt plant will produce no more than 540,000 tons of asphalt in any rolling 12 month period.
- The drum-mixer shall not operate more than 20 hour/day.
- The diesel engine generator shall not operate more than 20 hours/day.
- The generator will use fuel oil #2 with a sulfur content not to exceed 0.5%.
- The total amount of RAP used shall not exceed 216,000 tons in any rolling 12 month period.

New
The following significant permit conditions were added:

- The drum-mixer may also burn up to 20,000 gallons of a blend of fuel oil no. 2 and specification used oil in lieu of diesel fuel no. 2.
- The blended fuel oil will consist of, at most, 25% specification used oil.
- The sulfur content of the blended fuel oil shall not exceed 0.5% by weight.
- The following constituents/properties of the specification used oil shall not exceed the specified limits listed below:

Constituent/Property	Allowable Limit
Arsenic	5 ppm maximum
Cadmium	2 ppm maximum
Chromium	10 ppm maximum
Lead	100 ppm maximum
Total Halogen	1,000 ppm maximum
Sulfur	0.5% maximum by weight
Flash Point	100°F minimum
Polychlorinated Biphenyls (PCB)	< 2 ppm

Conclusion and Recommendation:

Actual emissions from the drum-mixer should be lower than estimated based on the following reasons:

1) The drum-mixer dryer may burn 100% fuel oil no. 2 and blends of fuel oil no.2 and specification used oil with no more than 25% specification used oil. Calculations were based on the worst case scenario using the maximum possible pollutant emissions from either fuel. This was done to predict the worst case emissions with the worst case fuel used.

2) The analysis was done assuming a maximum of 25% specification used oil blended with 75% fuel oil no. 2. In reality, when burned, the specification fuel oil in the blend would most likely be much lower than 25% due to the limited availability of specification used oil and due to the fact that the use of too much used oil in the blend would likely create problems with the burner.

3) Modeling analysis performed did not consider the maximum of 25% specification used oil or consider the 20,000 gallon restriction. Conservatively assumed 100% specification used oil (as specification used oil showed a higher short term emission rate).

4) Emission calculations were based on a production of 540,000 tons of asphaltic concrete per year. However, per file 0045-02, annual emission reports submitted by the facility indicate that the facility produces much less asphalt per year.

Based on the information submitted Grace Pacific Corporation, it is the preliminary determination of the Hawaii Department of Health (DOH), that the proposed project will be in compliance with the Hawaii Administrative Rules (HAR), Chapter 11-60.1 and not cause or contribute to a violation of any State or National ambient air quality standard. Therefore, the Hawaii DOH intends to amend Temporary Covered Source Permit 0040-02-CT, subject to the significant permit conditions and EPA review.