

**Minor and Significant Modifications to a Covered Source  
Review Summary**

**Application File Nos.:** 0212-20 / 0212-22

**Permit No.:** 0212-01-C

**Applicant:** Tesoro Hawaii Corporation

**Facility Title:** Petroleum Refinery  
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**Application Dates:** Minor Modification Application No. 0212-20 dated March 2, 2005  
Significant Modification Application No. 0212-22 dated March 29, 2007

**Proposed Project:**

SICC 2911 (Petroleum Refining)

**1. Minor Modification Application No. 0212-20**

This is a permit application to install a filter/condenser on storage tank 513 as described in Attachment II(E) of CSP No. 0212-01-C. The installation of an air pollution control will limit vapor mist emissions generated while filling the tank and enhance operational flexibility. This modification would help ensure compliance with the opacity standards, while filling the tank with straight-run asphalt.

**Background**

Unlike air-blown asphalt which is made in small 550 bbl batches, straight-run asphalt can be produced in comparatively large batches (25,000 bbl) by running certain crudes in block runs for several days before a turnaround. The straight-run asphalt can be stockpiled for future sale/distribution when the refinery and the asphalt manufacturing unit, in particular, is shut down. Straight-run asphalt directly from the VDU is not processed (air-blown) in the asphalt oxidizer.

Straight-run asphalt alone normally will not create substantial vapor opacity concerns and thus (unlike air-blown asphalt) is not regulated under 40 CFR 60 Subpart UU, or 40 CFR 63 Subpart LLLLLL. However, there is a potential that the run down of straight-run asphalt into storage tank 513 could make control of opacity more difficult, because previously produced air-blown asphalt will remain in the tank and because the fill rate and thus the vapor displacement rate is higher.

There is no prohibition on storing straight-run asphalt in storage tank 513 nor regulatory mandate for installing additional controls. The proposed filter/condenser is intended as a contingency measure to mitigate possible opacity concerns which might be aggravated by mixing straight-run asphalt with air-blown asphalt.

Storage tank 517 has remained empty. There is a possibility that this tank will be put in service to accept straight-run asphalt.

## Process Description

The Asphalt Manufacturing Unit (AMU) converts vacuum residual to asphalt for sale. The straight-run asphalt is produced directly from the Vacuum Distillation Unit. Specific crude types must be used to produce straight-run asphalt. Storage tanks 513 and 517 can be used to store the blown-asphalt or straight-run asphalt.

Normally asphalt from the AMU is pumped by P801 to storage tank 513. To prevent asphalt from setting up in the tank, it is circulated back through a feed heater in the AMU (H801) to maintain a temperature at 350-400 °F. Maintaining the tank temperature is critical whether the asphalt is produced by either the AMU or VDU.

## Modification Description

In anticipation that the liquid mist generated while filling the tank with straight-run asphalt will be more rapid than when filled by smaller batches of air-blown asphalt, a filter/condenser is to be installed on storage tank 513 to help control opacity. A model TVF-70 filter, from CECO Filter, Inc. is to be installed on the tank vent. The filter is specifically designed to control liquid asphalt emissions which consist partly of non-volatile organic compounds which are either filterable or condensable. The selected filter has a flow rate capacity of 70 acfm which equates to a tank fill rate of 11,500 bbls/day. The filter is a simple fiber bed control device specifically developed to handle liquid mist emissions from storage tanks. During operation, condensed liquid mist emissions in the vapor space above the liquid enter the filter's inlet flange on demand using pressure available from normal tank pumping operations. Condensed liquid and particles down to 0.1 micron are captured by the fiber bed filter and drain off for recovery while clean air exits the filter into the atmosphere. The condensate will be rerouted back into the tank. Efficiencies of 99.5 % or higher for particulates < 3 micron, and approaching 100% for particles > 3 micron are achieved by the condenser./filter.

## Emissions Increase/Decrease

On a Potential to Emit (PTE) basis emissions from the tank are expected to be unchanged because the opacity standard is already set by permit and federal regulations at zero percent. The installation of this filter/condenser is intended to maintain that standard when straight-run asphalt is being run-down to the tank (at a substantially faster rate than air blown asphalt). On an actual emissions basis the condenser/filter is expected to reduce VOC and PM emissions by

95% or more. While this additional control has not been needed to control emissions from air-blown asphalt, we expect that the condenser/filter will be necessary while filling the tank with straight-run asphalt.

Proposed Permit Language

The applicant proposed the following permit language:

“A filter/condenser shall be installed and in service on storage tank 513 at all times whenever the level in the tank rises more than 2,500 bbls in any 24 hour period. The filter/condenser may be taken out of service, without providing notice normally required by Attachment I, Standard Condition No. 16, providing the tank level does increase by more than 2,500 bbls in any 24 hour period.”

A permit modification application fee of \$200.00 for a minor modification was submitted by the applicant and processed.

In a letter dated June 22, 2005, the Department of Health later approved the installation and operation of the filter/condenser as an air pollution control device on asphalt storage tank 513 before issuing an amendment to the covered source permit pursuant to HAR 11-60.1-82(k)(1).

2. Significant Modification Application No. 0212-22

This is a permit application to modify and effectively decommission the Asphalt Manufacturing Unit. The refinery no longer produces asphalt by air blowing. Instead of producing asphalt by air blowing, the refinery has already successfully demonstrated and is now routinely producing asphalt directly from the Vacuum Distillation Unit (VDU).

The last time asphalt was made by air blowing was on March 1, 2006. A portion of the Title V permit has already been revised to reflect the change. On January 29, 2007, the DOH issued a letter which effectively authorized storage tank 517, which is listed in Attachment II(E) as part of the Asphalt Manufacturing Unit (AMU), to instead be used to store wastewater, more specifically spent caustic and associated wash waters prior to processing in the WTU. Storage tank 517 had never been used to store asphalt or hydrocarbons of any kind. The change in service, from empty to wastewater triggered a change of the applicability of federal standards. Instead of being subject to 40 CFR Part 60, Subpart UU, for asphalt storage tanks, the tank will instead be subject to 40 CFR Part 61, Subpart FF, for Benzene Waste Operations.

The applicant proposes to reuse a portion of the AMU, most notably the heater (H801), in a slightly different application, the rest of the AMU will be decommissioned. Aside from the changes to storage tank 517, the modifications proposed are as follows:

Heater H801

Instead of being used as an asphalt charge heater, H801 will be used to keep straight-run asphalt stored in storage tanks 512 and 513 hot and fluid. The heater itself would not be physically changed. The heater would remain subject to 40 CFR Part 60 Subpart J. There would be no increase or decrease in the Potential to Emit (PTE) emissions, because the fired duty of the heater (33 MMBtu/hr) would not be altered. Heater H801 has routinely been used as a recirculation heater to keep the vacuum bottoms (from non-asphalt producing crudes) stored in storage tank 512 and throughout the AMU hot and pumpable.

Oxidizer R801

The blower that forces air into the oxidizer, also known as reactor R801, will be decommissioned. The vessel itself will be retained and re-commissioned as a clean-out/receiving drum that will be used infrequently to clear asphalt from the circulating line. Conditions related to the blower and control of emissions from the reactor, could be entirely struck from the permit.

Incinerator H802

Since the oxidizer is being decommissioned, there is no need to retain the incinerator that is designed to control emissions from air blowing the asphalt. The incinerator and related equipment and all associated permit conditions may be struck. The elimination of waste gas from R801 and its incinerator H802 will reduce emissions. If H802, which is currently functional, is returned to service or used in different application, then this heater will be treated as a new source. This modification simply eliminates the function of H802 as a charge heater and limits its function to that of a tank/circulation heater.

Storage Tank 513

Since this tank will receive only straight-run asphalt and/or offspec asphalt, produced by the VDU while running select crudes, the tank should no longer be bound by 40 CFR Part 60, Subpart UU which is applicable only to tanks storing air-blown asphalt. This vertical fixed roof tank should be listed in Section II(M) and permitted with conditions like other tanks used to store heavy oil.

Storage Tank 512

Since July 1, 2006, storage tank 512 has and will continue to be used to store straight-run asphalt. It has never been used to store air-blown asphalt. The amount of asphalt produced by the straight-run is normally much greater than small (2000 bbls) batches produced by air blowing. Since storage tank 512 is nearly 5 times larger than storage tank 513, asphalt from the VDU will normally be produced into (run down to) storage tank 512. Likewise, storage tank 512 will also be the source of asphalt sold over the load rack. Storage tank 512 is currently listed in Section II(M) and permitted for heavy oil service. The permit conditions for storage tank 512 appear to be sufficient and should not need to be modified as a consequence of receiving straight-run asphalt or any of the changes described above.

Valves and Piping

A sizable portion of the piping and associated pumps and valves used to transfer hydrocarbons and asphalt between the tank farm and the AMU will remain in place. While some minor piping modifications are needed, there are no plans to install new pumps or to change the service of these lines (to light liquid) such that additional fugitive emissions monitoring would be triggered.

Suggested Permit Terms or Conditions

Principally to keep the permit in the same sequence in which it is currently ordered, the applicant suggested re-titling Section II (E) from Asphalt Manufacturing Unit to Asphalt Heating and Loading. In the Title V permit application dated March 28, 2005, the applicant had requested that the asphalt load rack be added to the permit. The asphalt load rack, also known as the black oil rack, predated the construction of the AMU, which is the reason it is speculated that the asphalt or black load rack is not currently listed on the Title V permit. As a result of eliminating much of the equipment discussed above, equipment descriptions for the oxidizer

and waste gas incinerator and associated permit conditions should be entirely deleted. The term oxidizer should be eliminated from the description of asphalt heater 801. The two storage tanks (513 and 517) and applicable conditions/regulations should be relocated to Section II(M) and Section II (J), respectively. Aside from the addition of the asphalt load rack, some of the permit revisions for the AMU that the applicant requested in the March 28, 2005 Title V application are no longer needed or appropriate as a result of the proposed reconfiguration. More specifically, 40 CFR Part 63, Subpart LLLLL, which applies to facilities that produce asphalt by air blowing, would not be applicable under this new configuration.

A permit modification application fee of \$1000.00 for a significant modification was submitted by the applicant and processed.

**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 Prohibition
HAR 11-60.1-31	Applicability
HAR 11-60.1-32	Visible Emissions
HAR 11-60.1-39	Storage of Volatile Organic Compounds
Subchapter 5	Covered Sources
Subchapter 6	Fees for Covered Sources, Noncovered Sources, and Agricultural Burning
HAR 11-60.1-111	Definitions
HAR 11-60.1-112	General Fee Provisions for Covered Sources
HAR 11-60.1-113	Application Fees for Covered Sources
HAR 11-60.1-114	Annual Fees for Covered Sources
HAR 11-60.1-115	Basis of Annual Fees for Covered Sources
Subchapter 8	Standards of Performance for Stationary Sources
Subchapter 9	Hazardous Air Pollutant Sources

Federal Requirements

40 CFR Part 60 - Standards of Performance for New Stationary Sources (NSPS)  
    Subpart J - Standards of Performance for Petroleum Refineries

40 CFR Part 61 - National Emission Standards for Hazardous Air Pollutants (NESHAPS)  
    Subpart FF – National Emission Standard for Benzene Waste Operations

40 CFR Part 63 - National Emission Standards for Hazardous Air Pollutants for Source Categories (Maximum Achievable Control Technologies (MACT) Standards)  
    Subpart CC - National Emission Standards for Hazardous Air Pollutants from Petroleum Refineries  
    Subpart DDDDD - The asphalt heater H801 is subject to 40 CFR Part 63, Subpart DDDDD – National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial and Institutional Boilers and Process Heaters.



**Prevention of Significant Deterioration (PSD):**

This significant modification is not subject to PSD review as the modification is not considered a major modification to a major stationary source as defined in HAR §11-60.1-131. The net emissions increase is not significant. See Table 2.

**Consolidated Emissions Reporting Rule (CERR):**

40 CFR Part 51, Subpart A - Emission Inventory Reporting Requirements, determines CER based on the emissions of criteria air pollutants from Type A and Type B point sources (as defined in 40 CFR Part 51, Subpart A), that emit at the CER triggering levels shown in Table 1.

**TABLE 1. - CERR/IN-HOUSE REPORTING APPLICABILITY**

<b>Pollutant</b>	<b>Type A CER Triggering Levels<sup>1,2</sup> (tpy)</b>	<b>Type B CER Triggering Levels<sup>1</sup> (tpy)</b>	<b>Pollutant</b>	<b>In-house Total Facility Triggering Levels<sup>3</sup> (tpy)</b>
NO <sub>x</sub>	≥2500	≥100	NO <sub>x</sub>	≥25
SO <sub>x</sub>	≥2500	≥100	SO <sub>x</sub>	≥25
CO	≥2500	≥1000	CO	≥250
PM <sub>10</sub> /PM <sub>2.5</sub>	≥250/250	≥100/100	PM/PM <sub>10</sub>	≥25/25
VOC	≥250	≥100	VOC	≥25
			HAPS	≥5

<sup>1</sup> Based on actual emissions

<sup>2</sup> Type A sources are a subset of Type B sources and are the larger emitting sources by pollutant

<sup>3</sup> Based on potential emissions

There is no change from Covered Source Permit No. 0212-01-C. This Type A facility emits above the Type A CER and in-house triggering levels. Therefore, CER and annual emissions reporting requirements are applicable. Also, annual emissions reporting is required for covered sources.

**Compliance Assurance Monitoring (CAM):**

No change from Covered Source Permit No. 0212-01-C. This facility is subject to CAM at 1<sup>st</sup> permit renewal.

**Synthetic Minor Source:**

No change from Covered Source Permit No. 0212-01-C. This facility is not a synthetic minor.

**Insignificant Activities:**

No change from Covered Source Permit No. 0212-01-C.

**Alternate Operating Scenarios:**

No change from Covered Source Permit No. 0212-01-C.

**Project Emissions:**

The proposed changes would eliminate the generation of waste gas from the oxidizer and the combustion of supplementary refinery fuel gas in the incinerator H802. Emissions from H802 will be eliminated on an actual and a potential (PTE) basis as summarized below.

**TABLE 2. – EMISSIONS SUMMARY**

Pollutant	Proposed Potential to Emit (PTE) (tpy)	2004 Actual Emissions <sup>1</sup> (tpy)	2005 Actual Emissions <sup>1</sup> (tpy)	2004 - 2005 Actual Average Emissions <sup>1</sup> (tpy)	Potential to Emit (PTE) <sup>2</sup> (tpy)	Net Emission Increase (tpy)	Significant Level (tpy)
NO <sub>x</sub>	0	1.546	1.071	1.308	56.59	- 1.308	40
SO <sub>2</sub>	0	0.116	0.058	0.087	9.505	- 0.087	40
CO	0	2.167	1.501	1.834	27.414	- 1.834	100
VOC	0	0.142	0.098	0.120	1.795	- 0.120	40
PM (total)	0	0.196	0.140	0.168	2.480	- 0.168	25

<sup>1</sup> Based on annual emission reports

<sup>2</sup> Based on the Title V permit application dated March 28, 2005

**Ambient Air Quality Assessment:**

An Ambient Air Quality Impact Assessment (AAQIA) was not performed since the proposed project will result in the reduction of emissions from the asphalt heating.

**Significant Permit Conditions:**

The following significant changes were made to Covered Source Permit No. 0212-01-C:

- Attachment II(E): Special Conditions - Asphalt Manufacturing Unit and Asphalt Storage Tanks was renamed to Attachment II(E): Special Conditions – Asphalt Loading and Heating.
- The asphalt loading rack is now listed in the equipment section of Attachment II(E) of the permit.
- The asphalt waste gas incinerator H802 and asphalt oxidizer R801 were removed from Attachment II(E) of the permit.
- The asphalt oxidizer heater H801 was renamed to the asphalt heater H801 in Attachment II(E) of the permit. The asphalt heater H801 will remain subject to NSPS Subpart J - Standards of Performance for Petroleum Refineries.
- Storage tanks nos. 513 and 517 are no longer subject to 40 CFR Part 60, Subpart UU - Standards of Performance for Asphalt Processing and Asphalt Roofing Manufacture since the refinery no longer produces asphalt by air blowing. Straight-run asphalt is produced directly from the Vacuum Distillation Unit (VDU).

## PROPOSED

- Storage tank no. 513 will be subject to 40 CFR Part 63, Subpart CC - National Emission Standards for Hazardous Air Pollutants from Petroleum Refineries and will be moved to Attachment II(M): Special Conditions – Petroleum Storage Tanks. This vertical fixed roof tank will be listed in Special Condition No. A.1.d.xiv. and permitted with conditions like other tanks used to store heavy oil in Special Conditions Nos. B.4.a. and D.5.
- Storage tank no. 517 will be subject to 40 CFR Part 61, Subpart FF - National Emission Standard for Benzene Waste Operations and will be moved to Attachment II(J): Special Conditions – Wastewater Treatment Unit. This vertical fixed roof tank will be listed under the Wastewater Collection System in Special Condition No. A.1.h.ii.

### **Conclusion and Recommendations:**

Recommend issuance of the significant modification to existing Covered Source Permit No. 0212-01-C based on the significant permit conditions shown above. The proposed project will decommission the Asphalt Manufacturing Unit and clarify the current asphalt heating and loading operations at the refinery. Compliance with all State and Federal regulations will be maintained, including the State and National ambient air quality standards. A 30-day public comment period and a 45-day EPA review period are also required before issuance of the permit modification.

Reviewer: Darin Lum  
Date: 9/07