

PROPOSED

**PERMIT APPLICATION REVIEW
COVERED SOURCE PERMIT (CSP) NO. 0078-01-C
Application Renewal No. 0078-05**

Applicant: Chevron Products Company
Facility: Honolulu Marketing Terminal - Marine
Location: 777 North Nimitz Highway, Honolulu, Oahu

Mailing Address: 933 North Nimitz Highway
Honolulu, Hawaii 96817

Responsible

Official: Dennis K. Morgan	Contact: Todd E. Osterberg
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Equipment:

- a. Marine vessel loading dock with headers, flexible lines, flanges or other connectors, fittings, piping, pumps, and valves at Pier 30 for submerged loading of volatile organic liquid (VOL) into marine vessel storage tanks;
- b. 7,570 barrel Tank No. 3 with geodesic dome fixed roof, internal floating roof, and mechanical shoe primary seal;
- c. 38,805 barrel Tank No. 4 with geodesic dome fixed roof, internal floating roof, and mechanical shoe primary seal;
- d. 46,497 barrel Tank No. 5 with fixed cone roof, internal floating roof, primary mechanical shoe seal, and secondary wiper seal;
- e. 1,400 barrel Tank No. 6 with internal floating roof and vapor-mounted primary seal;
- f. 31,863 barrel Tank No. 9 with geodesic dome fixed roof, internal floating roof, and mechanical shoe primary seal;
- g. 29,276 barrel Tank No. 10 with fixed cone roof, internal floating roof, primary mechanical shoe seal, and secondary wiper seal;
- h. 1,301 barrel Tank No. 24 with fixed cone roof, internal floating roof, primary mechanical shoe seal, and secondary wiper seal;
- i. 13,062 barrel Tank No. 27 with geodesic dome fixed roof, internal floating roof, and mechanical shoe primary seal;
- j. 13,408 barrel Tank No. 28 with fixed roof, internal floating roof, and mechanical shoe primary seal;
- k. 12,075 barrel Tank No. 29 with geodesic dome fixed roof, internal floating roof, and mechanical shoe primary seal;
- l. 11,666 barrel Tank No. 30 with geodesic dome fixed roof, internal floating roof, mechanical shoe primary seal, and secondary flex seal;
- m. 15,019 barrel Tank No. 31 with geodesic dome fixed roof, internal floating roof, mechanical shoe primary seal, and secondary flex seal;

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- n. 3,410 barrel Tank No. 34 with fixed cone roof, internal floating roof, and vapor mounted primary seal; and
- o. 9,806 barrel Tank No. 47 with fixed cone roof, internal floating roof, and mechanical shoe primary seal.

1. Background

- 1.1 Chevron Products Company (hereinafter referred to as “Chevron”) has submitted a renewal application for its permit to operate Honolulu Marketing Terminal – Marine. The marine terminal distributes products that include motor gasoline, naphtha (whole straight run gasoline), denatured ethanol (ethanol mixed with gasoline), jet fuel, and distillate oils. Refined petroleum products are received from the Chevron Hawaii refinery by pipeline and stored in above ground storage tanks at the marine terminal. Products from the marine terminal are loaded into marine vessels at the Pier 30 loading dock for transport to Chevron terminals on outer islands. Product is also transferred through pipeline to the load rack at Chevron’s transportation terminal down the street from the Chevron marine terminal. Tank trucks deliver product from load racks to service stations and commercial/industrial accounts. The standard industrial classification (SIC) code for this facility is 5171 (Petroleum Bulk Stations and Terminals).
- 1.2 Chevron uses various controls to reduce volatile organic compound (VOC) and hazardous air pollutant (HAP) emissions from loading product into cargo tanks at its marketing terminals. Chevron’s transportation terminal is equipped with a vapor recovery unit and outer island terminals use vapor combustion systems to control emissions. Emissions from the marine terminal are higher than those for other terminals because products are loaded at the marine terminal for shipping to the other distribution terminals and an air pollution control device is not used at the marine terminal for loading product into marine vessel storage tanks.
- 1.3 Denatured ethanol and motor gasoline are blended at load racks to meet Hawaii’s requirement for gasoline to contain 10% ethanol. As indicated by Chevron, ethanol is denatured with 2.2% to 2.5% unleaded gasoline during the receipt from the ship to storage tanks.
- 1.4 Tanks at the marine terminal provide a means to dewater product. Water has a higher density than products (e.g., gasoline, jet fuel, and diesel) stored inside tanks and water settles to the bottom of a tank during product storage. Each tank has a sump in the tank’s center at the bottom of the tank. Pressure from product above the water enables water to be removed from the sump through piping that extends from inside the sump to the tank exterior. A floating suction is used for some of the tanks to draw product from the top of the tank to ensure that product supplied is free of water. Assurance that product does not contain water is especially important for jet fuel.
- 1.5 A site investigation of Honolulu Marketing Terminal – Marine was conducted on July 8, 2011. Pictures from the investigation are shown in Enclosure (1).
- 1.6 The applicant has requested that the throughput limit specified in the permit for ethanol be changed to a throughput limit for denatured ethanol.

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- 1.7 The applicant indicated that aviation gasoline and Dimate are currently not distributed at the marine terminal.
- 1.8 The marine and transportation terminals Chevron operates along North Nimitz Highway are on adjacent properties. According to Environmental Protection Agency (EPA) policy, emissions from sources located on adjacent property may need to be aggregated to determine the category of permitting required. Although the facilities have the same two-digit SIC code and are connected by a pipeline, the facilities are considered separate sources because less than 50% of the output from the marine terminal is dedicated to the transportation terminal. As such, emissions do not need to be aggregated for combining facilities into one source. Information from 2010 annual emissions reporting shows that 35% of product output from the marine terminal is used for the transportation terminal (see table below).

Product	Honolulu Terminal – Marine Product Output to Marine Vessels and Transportation Terminal (barrels)	Honolulu Transportation Terminal Product Output (barrels)
Motor Gasoline	2,760,266	1,461,041
Naphtha	387,498	43,742
Ethanol/Denatured Ethanol	271,792	113,068
Diesel	1,667,520	414,397
Jet A	706,561	3,977
Total→	5,793,637 ^a	2,036,225 ^a

a: $(2,036,225/5,218,453) (100\%) = 35\%$

2. Applicable and Non-applicable Requirements

2.1 Hawaii Administrative Rules (HAR)

Chapter 11-59, Ambient Air Quality Standards

Chapter 11-60.1, Air Pollution Control

Subchapter 1, General Requirements

Subchapter 2, General Prohibitions

§11-60.1-31 Applicability

§11-60.1-39 Storage of Volatile Organic Compounds

§11-60.1-41 Pump and Compressor Requirements

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, New Source Performance Standards

§11-60.1-161 New Source Performance Standards

Subchapter 9, Hazardous Air Pollutants

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- 2.2 40 Code of Federal (CFR), Part 60 – NSPS, Subpart Ka, Standards of Performance for Storage Vessels for Petroleum Liquids for Which Construction, Reconstruction, or Modification Commenced After May 18, 1978, and Prior to July 23, 1984 is not applicable to tanks at this facility because no tanks have been reconstructed or modified between 1978 and 1984.
- 2.3 Tank Nos. 5, 10, and 30 are subject to 40 CFR Part 60, New Source Performance Standards, Subpart Kb, Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for which Construction, Reconstruction, or Modification Commenced after July 23, 1984 because these tanks were reconstructed after 1984. Alterations to Tank Nos. 5, 10, and 30 for storing gasoline and denature ethanol triggered a reconstruction because the costs for the new construction/components were greater than 50% of the costs of a comparable tank that is entirely new.
- 2.4 Tank Nos. 3, 4, 5, 6, 9, 10, 24, 27, 28, 29, 30, 31, 34, and 47 are subject to 40 CFR Part 63, Subpart BBBBBB – National Emission Standards for Hazardous Air Pollutants for Source Category: Gasoline Distribution Bulk Terminals, Bulk Plants, and Pipeline Facilities because the tanks will store gasoline as worst-case scenario. Option 2 from Table 1 to Subpart BBBBBB applies to the tanks because tank capacities are greater than 151 m³ (about 40,000 gallons). Either Option 2(b) or 2(d) from Subpart BBBBBB will apply because the tanks are equipped with internal floating roofs. Pursuant to 40 CFR §63.11087(f), gasoline storage Tank Nos. 5, 10, and 30 are in compliance with Subpart BBBBBB because these tanks are already subject to 40 CFR Part 60, Subpart Kb. The facility is designated a bulk gasoline terminal because the gasoline throughput is greater than 20,000 gallons per day. The total combined motor gasoline throughput allowed by the permit is 4,137,881 barrels per year (476,140 gallons per day). Also, pursuant to 40 CFR §63, the loading of gasoline into marine tank vessels at bulk facilities is not subject to Subpart BBBBBB.
- 2.5 The following table shows permitted tanks, the dates tanks were last cleaned, the dates the tanks were installed and modified, and the applicable regulations.

Tank No.	Date Tank Last Cleaned	Installation and Modification Dates	Applicable Subparts
3	1994	1911	BBBBBB Part 63
4	1995	1914	BBBBBB Part 63
5	2005	1915, modified 2005	BBBBBB Part 63 Kb Part 60
6	2003	1915	BBBBBB Part 63
9	2004	1917	BBBBBB Part 63
10	1986	1917, modified 2005	BBBBBB Part 63 Kb Part 60
24	2005	1948	BBBBBB Part 63
27	2003	1952	BBBBBB Part 63
28	1986	1952	BBBBBB Part 63
29	2004	1952	BBBBBB Part 63
30	1983	1952, modified 2001	BBBBBB Part 63

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			Kb Part 60
31	1999	1952	BBBBBB Part 63
34	1983	1952	BBBBBB Part 63
47	1999	1958	BBBBBB Part 63

- 2.6 Loading marine vessels from the loading dock at Pier 30 is not subject to emissions standards specified in 40 CFR Part 63, Subpart Y, National Emission Standards for Marine Tank Vessel Loading operations because emissions from the marine terminal are less than 10 tons per year any single hazardous air pollutant (HAP) and less than 25 tons per year of total combined HAPs. Subpart Y specifies record keeping requirements from 40 CFR §63.567(j)(4) and emission estimation requirements from 40 CFR §63.565(1) for existing sources with emissions less than major source thresholds for HAPs. However, throughput limits are specified for loading marine vessels to prevent an exceedance of major source HAP thresholds. Therefore, the facility is not subject to 40 CFR Part 63, Subpart Y.
- 2.7 The Consolidated Emissions Reporting Rule (CERR) is applicable because emissions from this facility exceed reporting levels pursuant to 40 CFR 51, Subpart A for Type A sources.
- 2.8 A Best Available Control Technology (BACT) analysis is required for new sources or modifications to existing sources that would result in a net emission increase above significant levels as defined in HAR, Section 11-60.1-1. Although the applicant requests that the throughput limit for ethanol be changed to a throughput limit for denatured ethanol, the net emissions increase from the change does not exceed the significant emissions level for volatile organic compounds (VOCs). As such, a BACT analysis is not required (see table below).

Pollutant	Emissions (TPY) 833,33 Barrel per Year Ethanol Throughput	Emission (TPY) 833,333 Barrel per Year Denatured Ethanol Throughput	Net Emissions Increase (TPY)	Significant Emissions Level (TPY)
VOC	14.9	23.6	8.7	40

- 2.9 The facility is grandfathered from prevention of significant deterioration (PSD) review. Although the marine marketing terminal is a major stationary source for VOCs (the terminal emits more than 100 TPY VOCs and is one of 28 source categories listed as petroleum storage and transfer units with a total storage capacity exceeding 300,000 barrels), there have been no modifications to this facility that cause an increase in emissions above PSD permitting thresholds.
- 2.10 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. 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 greater than the major source level; and (5) not otherwise be exempt from CAM. Although the terminal is a major source for VOCs, CAM is not applicable because this terminal does not use a control device, as defined in 40 CFR Part 64, to achieve compliance with an applicable limit or standard.

3. Insignificant Activities

3.1 The following is a list of insignificant activities at the terminal. Tanks listed in (a)-(j) are exempt per HAR §11-60.1-82(f)(7). Tanks listed in (r)- (n) are exempt per HAR §11-60.1-82(f)(1). The oil water separators and sumps listed in (o)-(s) are exempt per HAR §11-60.1-82(f)(7). The emergency diesel engine generator listed at (t) is exempt per HAR §11-60.1-82(f)(5). Marine vessel loading and unloading operations for diesel and fuel oil listed in (u) and (v) are exempt per HAR §11-60.1-82(f)(7).

- a. 15,592 barrel fixed cone roof Tank No. 1;
- b. 8,447 barrel fixed roof Tank No. 2;
- c. 1,400 barrel fixed cone roof Tank No. 7;
- d. 12,464 barrel fixed cone roof Tank No. 14;
- e. 20,848 barrel fixed cone roof Tank No. 19;
- f. 10,942 barrel fixed cone roof Tank No. 26;
- g. 5,715 barrel fixed cone roof Tank No. 32;
- h. 10,627 barrel fixed cone roof Tank No. 48;
- i. 21,022 barrel fixed cone roof Tank No. 50;
- j. 24,756 barrel fixed cone roof Tank No. 51;
- k. 1,000 gallon horizontal fixed roof Tank No. 52;
- l. 500 barrel fixed cone roof Tank No. 53;
- m. 400 gallon portable tote tank;
- n. 760 gallon recovered oil tank;
- o. Oil water separator inside open concrete pit;
- p. Three (3) oil water separators inside closed concrete pits;
- q. Monarch System oil water separator, job no. 890, serial no. MSECS 28/75 8901;
- r. Sump (one compartment concrete pit);
- s. Sump (two compartment concrete pit);
- t. 256 kW emergency Caterpillar diesel engine generator, model no. 3406B, serial no. 4RC00344PP04841;
- u. Marine vessel loading operations for diesel and fuel oil; and
- v. Marine vessel unloading operations.

4. Alternative Operating Scenarios

4.1 No alternate operating scenarios were proposed by the applicant for the permit renewal.

5. Air Pollution Controls

5.1 Fourteen (14) tanks at the facility require internal floating roofs and tank seal systems to control VOC and HAP emissions for storing motor gasoline worst-case.

6. Project Emissions

6.1 Potential emissions from marine vessel loading operations were based on emission factors from AP-42, Section 5.2 (6/08) "Transportation And Marketing Of Petroleum Liquids" with

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the following assumptions (see Enclosure (2)):

- a. Maximum permitted loading throughput of 4,137,881 barrels per year (173,791,002 gal/yr) to determine VOC emissions from total combined loading of motor gasoline, naphtha, aviation gasoline, and Dimate;
- b. Maximum throughput of 833,333 barrels per year (34,999,986 gal/yr) to determine VOC emissions from loading denatured ethanol;
- c. Maximum permitted loading throughput of 6,271,619 barrels per year (263,407,998 gal/yr) to determine VOC emissions from loading Jet A;
- d. VOC emission factor for loading gasoline into marine tank vessels for typical overall situation of 3.4 lb/1000 gal based on Section 5.2, Table 5.2-2;
- e. A VOC emission factor for loading denatured ethanol into marine tank vessels of 1.35 lbs/1,000 gallons based on Section 5.2 emissions factor Equation (1) and assuming a saturation factor (S) for submerged barge loading of 0.5, a true vapor pressure of 2.4471 psi, a molecular weight of 47.85 lb/lb-mole, and a temperature of 537 °K;
- f. A VOC emission factor for Jet A loading of 0.03 lbs/1,000 gallons based on Section 5.2 emission factor Equation (1) and assuming a saturation factor (S) for submerged barge loading of 0.5, a true vapor pressure of 0.02 psia, a molecular weight of 130 lb/lb-mole, and a temperature of 537 °K;
- g. Vapor mass fractions for pollutants from gasoline, denatured ethanol, and jet A were multiplied by the total VOC emissions to determine HAP emissions; and
- h. Potential VOC/HAP emissions, shown in Enclosure (2), are summarized as follows:

Marine Vessel Loading Emissions				
Pollutant	Emission (TPY)			
	Gasoline	Denatured Ethanol	Jet A	Total
VOC	295.4	23.8	4.0	323.2
HAPs	2.954	0.052	0.606	3.612

6.2 Potential emissions from permitted tanks at the tank farm were estimated with EPA's TANKS 4.0.9d program. The VOC emissions were based on a total combined gasoline and naphtha throughput of approximately 4,137,881 barrels per year (the total combined throughput limit specified in the permit for loading marine vessels with either gasoline, naphtha, aviation gasoline, and Dimate) plus an additional 474,500,000 gallon per year gasoline throughput based on permit limit at the transportation terminal. A majority of the throughput was assumed to be gasoline handled by Tanks Nos. 3, 4, 6, 9, 27, 28, 29, 30, 34, and 47. Additional VOC emissions were estimated for storing naphtha inside Tank No. 31. The VOC emissions were also based on a total throughput for denatured ethanol of approximately 833,333 barrels per year (the total throughput limit specified in the permit for loading marine vessels with denatured ethanol). The denatured ethanol throughput was assumed to be handled by Tank Nos. 5 and 10. Vapor mass fractions of components for gasoline, naphtha, and denatured ethanol were multiplied by the total VOC emissions to

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determine HAP emissions. Emissions were not estimated from tanks storing Jet A and diesel because these tanks are insignificant activities. Potential emissions from the tank farm are shown in Enclosure (3) and summarized below:

Tank Farm Emissions	
Pollutant	Tank Nos. 3, 4, 5, 6, 9, 10, 24, 27, 28, 29, 30, 31, 34, and 47 Emissions (TPY)
VOC	46.7
HAPs	0.483

6.3 Emissions from equipment leaks were determined based on New Equipment Leak Emission Factors for Petroleum Refineries, Gasoline Marketing, and Oil & Gas production, February 1995 [EPA-453/R-95-017], Table 2.3. Emission factors were selected from the light liquid group for pumps, valves, connectors, flanges, and fittings. Information from the application on the number of pump seals, valves, and connectors was used to determine emissions. Vapor weight fractions of pollutants from data for gasoline were multiplied by the total VOC emissions to determine HAP emissions. Emission estimates are shown in Enclosure (4) and summarized below as follows:

Pollutant	Emissions (TPY)
	Fittings (connectors and flanges), Other, Pumps, and Valves in Gas and Light Liquid Service
VOC	0.938
HAPs	0.009

6.4 Worst-case yearly emissions of VOCs and HAPs from operating HTM are shown below.

Facility Emissions				
Pollutant	Emissions (TPY)			Total Emissions (TPY)
	Marine Vessel Loading	Tank Farm	Equipment Leaks	
VOC	323.2	46.7	0.9	370.8
HAPs	3.612	0.483	0.009	4.1

7. Air Quality Assessment

7.1 An ambient air quality impact assessment is not required because emissions from tanks and the marine vessel loading dock are fugitive VOC and HAP emissions. The Department of Health Clean Air Branch generally does not perform modeling for fugitive sources of emissions.

8. Significant Permit Conditions

8.1 The total combined throughput for loading marine vessels at the loading dock shall not exceed 4,137,881 barrels of motor gasoline, naphtha, aviation gasoline, and Dimate, on a rolling twelve month (12-month) basis.

8.2 The total throughput for loading marine vessels at the loading dock shall not exceed 833,333 barrels of denatured ethanol on a rolling twelve-month (12-month) basis.

8.3 The total throughput for loading the marine vessels at the loading dock shall not exceed 6,271,619 barrels of Jet A on a rolling twelve month (12-month) basis.

Reason for 8.1 through 8.3: These conditions are based on throughput limits proposed by Chevron for operating the marine terminal. The throughput limits prevent the facility from exceeding major source thresholds for HAPs. Condition 8.1 is from a throughput limit specified in the initial covered source permit restricting the loading of motor and aviation gasoline into marine vessels only. The throughput limit specified in 8.1 does not include the amount of product supplied by pipeline to the Chevron transportation terminal. The throughput limit in 8.1 was changed to add naphtha and Dimate to the total combined product limit in 2004. Condition 8.2 is a throughput limit proposed by Chevron in 2005 for supplying gasoline with 10% ethanol. The throughput limit in 8.2 is being changed in this permit application review to a throughput limit for denatured ethanol as requested by Chevron. Condition 8.3 is a throughput limit for Jet A that hasn't changed since the initial covered source permit was issued in 1999.

8.4 Requirements from 40 CFR Part 60, Subpart Kb are incorporated into the permit for Tank Nos. 5, 10, and 30.

Reason for 8.4: The tanks are subject to 40 CFR Part 60 Subpart Kb because the tanks were reconstructed after 1984. Tank No. 30 was reconstructed in 2001. Tank Nos. 5 and 10 were upgraded in 2005 to store denatured ethanol which triggered reconstruction in 2005.

8.5 Conditions are incorporated for Tank Nos. 3, 4, 5, 6, 9, 10, 24, 27, 28, 29, 30, 31, 34, and 47 for operating in accordance with 40 CFR Part 63, Subpart BBBBBB.

Reason for 8.5: Incorporate conditions pursuant to Paragraph 2.4 of this permit application review.

8.6 Tanks greater than 40,000 gallons in capacity storing VOL with a true vapor pressure equal to or greater than 1.5 psia (e.g., transmix, denatured ethanol, naphtha, aviation gasoline, motor gasoline, etc.) shall be pressurized to prevent vapor or gas loss to the atmosphere or

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designed and equipped with one of the following vapor loss control devices:

- a. A floating roof as specified in HAR §11-60.1-39 (a)(1);
- b. A vapor recovery system as specified in HAR §11-60.1-39 (a)(2); or
- c. Other equipment or means of equal efficiency for purposes of air pollution control as may be approved by the Department of Health.

Reason for 8.6: This condition was incorporated to ensure that tanks greater than 40,000 gallons in capacity are equipped with adequate controls to prevent vapor losses to the atmosphere. Information from 2010 monitoring reports submitted for the marine terminal indicate true vapor pressures above 1.5 psia for denatured ethanol (2.20 – 2.57 psia from Tank 10), transmix (6.66 -8.33 psia from Tank 47), naphtha (4.09 – 4.75 psia from Tank 31), and gasoline (6.45 - 8.21 psia from Tank 27).

9. Conclusion and Recommendation

9.1 Actual emissions should be lower than those estimated because the marine terminal is not expected to reach the maximum throughput limits specified for products loaded into marine vessels or supplied to the transportation terminal. The marine terminal's total combined motor gasoline and naphtha throughput for 2010 was 3,147,764 gallons per year which is only 2% of the total combined throughput limit specified for loading motor gasoline, naphtha, aviation gasoline, and Dimate into marine vessel storage tanks. Permitted tanks at the marine terminal are all equipped with internal floating roofs and tank seal systems to control VOCs and HAPs. Recommend issuance of the permit subject to the significant permit conditions, 30-day the public comment period, and the 45-day review by EPA.

Mike Madsen 7-14-2011