PROPOSED

PERMIT APPLICATION REVIEW
COVERED SOURCE PERMIT (CSP) NO. 0080-01-C
Modification Application No. 0080-06

Applicant: Chevron Products Company

Facility: Port Allen Marketing Terminal

***Location:** 260 Aka'ula Road (A & B Road), Eleele, Kauai

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1. Background

1.1 Chevron Products Company has submitted an application to modify their covered source permit for Port Allen Marketing Terminal to store and blend denatured ethanol with gasoline for distribution as a fuel. The modification is requested pursuant to a state requirement to blend 10% ethanol with gasoline by April 2006. The 10% ethanol and 90% gasoline blend is designated E10. Literature indicates that the E10 blend reduces carbon monoxide from combustion in motor vehicles better than any other reformulated gasoline. The terminal consists of storage tanks and one bottom loading load rack. The load rack is equipped with a vapor combustion system to control volatile organic compounds (VOCs). Tanks currently permitted at the facility include Tank Nos. 1, 2, and 4 which are equipped with internal floating roofs for controlling VOCs. The terminal receives product by barge from Honolulu Terminal Marine. The standard industrial classification code for this terminal is 5171 (Petroleum Bulk Stations and Terminals). Information for modifications that will be made for denatured ethanol storage and its blending with gasoline at the load rack are as follows:

a. Tank Nos. 5 and 12 will be upgraded to store denatured ethanol with approximately 5% gasoline.

b. Tank No. 5 has a working capacity of 3,400 barrels.

c. Tank No. 12 has a working capacity of 1,600 barrels.

d. Emissions for the modification of Tank Nos. 5 and 12 will be based on the storage of motor gasoline worst-case.

e. Tank Nos. 5 and 12 will be equipped with an Allentech Flex-a-span primary mechanical shoe seal. The tanks will probably be equipped with a secondary seal also.

f. The total denatured ethanol that is blended with gasoline will be included with the total combined 5,631,429 barrel per year throughput allowed for aviation gasoline, motor gasoline, and naphtha/whole straight run gasoline. The denatured ethanol will be metered separately prior to mixing with gasoline.

g. Ethanol will be supplied pre-mixed with 5% gasoline from HTM.

h. An ethanol blending apparatus will be installed for the loading rack for blending the denatured ethanol with gasoline.

i. Ethanol is not a hazardous air pollutant (HAP).

2. 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

2.2. Tank Nos. 5 and 12 are being upgraded and will be subject to 40 Code of Federal Regulations (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 the tanks are greater than 151 m^3 (greater than about 40,000 gallons) and will be storing motor gasoline worst-case with a true vapor pressure greater than 0.507 psi. AP-42 indicates a true vapor pressure for gasoline with Reid vapor pressure of 10 that is 9.9 psi at 80 °F. AP-42 indicates the true vapor pressure of ethanol at 80 °F is 1.2 psi. The working volumes of Tank Nos. 5 and 10 are 142,800 gallons and 67,200 gallons, respectively. Records indicate that Tank No. 5 previously stored jet fuel and diesel. There are no records that Tank No. 5 stored gasoline. As such, the change to store gasoline is a modification because there is an increase in emissions. Also, records indicate that Tank No. 12 stored aviation gasoline worst-case during its service history and that the tank originally was constructed with an aluminum internal floating roof. The aluminum internal floating roof was removed and the tank was converted to jet fuel storage around 1999. Because motor gasoline is generally more volatile than aviation gasoline, the switch to store motor gasoline causes an increases emissions and; therefore, the change in product storage for Tank No. 12 is a modification. Tank No. 1 is already subject to Subpart Kb standards.

2.3 The bottom loading load rack is subject to 40 CFR, Part 60 - New Source Performance Standards (NSPS), Subpart XX, Standards of Performance for Bulk Gasoline Terminals because the bottom loading load rack was constructed after December 17, 1980.

2.4 The facility will be placed into the Compliance Data System (CDS) because the terminal is a covered source.

2.5 The Consolidated Emissions Reporting Rule (CERR) is not applicable because emissions from the facility do not exceed reporting levels pursuant to 40 CFR 51 (see table below).

CERR APPLICABILITY			
Pollutant	Potential Emissions (TPY)	CERR Triggering Levels (TPY)	
		1 year cycle (Type A sources)	3 year cycle (Type B sources)
VOC	57.2	≥ 250	≥ 100

2.6 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. The changes to Tank Nos. 5 and 12 to store gasoline worst-case will not increase emissions above the significant level as shown in the table below. As such, a BACT review is not applicable to this facility.

BACT APPLICABILITY		
Pollutant	Emissions (TPY)[a]	Significant Level (TPY)
VOC	6.9	40

a: Based on emissions from the following:

i. Tank No. 5 storing gasoline worst-case; and
ii. Tank No. 12 storing gasoline worst-case.

2.7 Prevention of significant deterioration (PSD) does not apply because emissions from the terminal are less than major source thresholds.

2.8 The facility is not a major source for hazardous air pollutants (HAPs) and is not subject to any National Emissions Standards for HAPs or Maximum Achievable Control Technology standards under 40 CFR Parts 61 or 63.

2.9 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 load rack relies on a vapor combustion system to achieve compliance with the federal VOC standard required by 40 CFR 60, Subpart XX and has potential pre-control emission greater than the major source level for VOC, CAM is not applicable to the load rack because this terminal is not a major source.

2.10 The facility is a synthetic minor source because the throughput limitation of 5,631,429 barrels/yr restricts emissions from the terminal to below major source thresholds. The yearly throughput limit was based on loading one 9,000 gallon tank truck every 20 minutes. Maximum capacity of the terminal is 4,800 gallons per minute based on the capacity of the vapor combustion system (2,522,880,000 gallons/yr).

3. Insignificant Activities

3.1 The following is a list of insignificant activities at the terminal. Tanks listed in (a), (b) and (d) are exempt per HAR §11-60.1-82(f)(7-D). Tanks listed at (c) and (e) through (h) are exempt per HAR §11-60.1-82(f)(1). The oil water sump and separator listed at (i) and (j) are exempt per HAR §11-60.1-82(f)(7).

a. 6,174 barrel vertical fixed cone roof Tank No. 3 currently storing low sulfur diesel;
b. 9,166 barrel vertical fixed cone roof Tank No. 14 currently storing high sulfur diesel;
c. 432 barrel vertical fixed cone roof Tank No. 16 currently storing transmix;
d. 34,312 barrel vertical fixed cone roof Tank No. 21 currently storing high sulfur diesel;
e. 179 barrel horizontal fixed roof fuel additive Tank No. 22;
f. 500 gallon transmix tank;
g. 499 gallon propane tank;
h. two (2) 400 gallon portable tote tanks;
i. 7,000 gallon concrete sump; and
j. AFL oil water separator.

4. Alternative Operating Scenarios

4.1 No alternate operating scenarios were proposed for the permit modification.

5. Air Pollution Controls

5.1 Five (5) tanks at the facility require internal floating roofs to control VOC/HAP emissions for storing motor gasoline, aviation gasoline, naphtha, or denatured ethanol. Tank Nos. 5 and 12 that are being upgraded to store gasoline worst-case are among the tanks with internal floating roofs.

5.2 The bottom loading load rack is equipped with a John Zink vapor combustion system to control VOC/HAP emissions from tank truck loading. Maximum specified tank truck loading rate for the vapor combustion system is 4,800 gallons-per-minute. Minimum specified loading rate for the vapor combustion system is 150 gallons-per-minute. The burner pilot fuel is propane.

6. Project Emissions

6.1 Emissions for loading products at the bottom loading load rack were based on a total combined aviation gasoline, denatured ethanol, motor gasoline, and naphtha/whole straight run gasoline throughput limit of 5,631,429 barrels (236,520,018 gallons) per year and the requirement that emission to the atmosphere from the vapor combustion system do not exceed 35 milligrams of total organic compounds per liter of gasoline loaded. The NO_X, CO, and SO_X emissions were based on the vapor combustion system's capacity to treat 4,800 gallons of gasoline per minute and manufacturer's data on the milligram of pollutant per liter of gasoline loaded. The HAP emissions were based on the vapor mass fraction for pollutants in naphtha worst-case. Emissions are summarized as follows:

Bottom Loading Load Rack (Gasoline)				
Pollutant	Vapor Mass Fraction	Emission (lb/hr)	Emission (g/s)	Emission (TPY)
VOC (see Note a)	----------	----------	----------	34.6
NO_x (see Notes b, c and d)	----------	9.620	1.215	4.0
CO (See Notes e, f, and g)	----------	24.050	3.037	9.9
SO_x (See Notes h, i, j, and k)	----------	5.813	0.734	2.4
Benzene	0.0052	----------	----------	0.180
Hexane (n) [max. single HAP]	0.0163	----------	----------	0.563
Toluene	0.0056	----------	----------	0.194
Xylene (-m)	0.0009	----------	----------	0.031
Xylene (-o)	0.0004	----------	----------	0.014
Xylene (-p)	0.0004			0.014
			Total HAPs------->	0.996

a: (35 mg/liter)(236,520,018 gal/yr)(liter/0.264 gal)(10^{-3} g/mg)(kg/1,000 g)(2.2046 lb/kg)(ton/2,000 lb) = 34.565 ton/yr
b: (4,800 gal/min)(4 mg/liter)(liter/0.264 gal)(10^{-3} g/mg)(kg/1,000 g)(2.2046 lb/kg)(60 min/hr) = 9.620 lb/hr
c: (9.620 lb/hr)(hr/3,600 sec)(kg/2.2 lb)(1,000 g/kg) = 1.215 g/sec
d: (4 mg/liter)(236,520,018 gal/yr)(liter/0.264 gal)(10^{-3} g/mg)(kg/1,000 g)(2.2046 lb/kg)(ton/2,000 lb) = 3.950 ton/yr

e: (4,800 gal/min)(10 mg/liter)(liter/0.264 gal)(10^{-3} g/mg)(kg/1,000 g)(2.2046 lb/kg)(60 min/hr) = 24.050 lb/hr
f: (24.050 lb/hr)(hr/3,600 sec)(kg/2.2 lb)(1,000 g/kg) = 3.037 g/sec
g: (10 mg/liter)(236,520,018 gal/yr)(liter/0.264 gal)(10^{-3} g/mg)(kg/1,000 g)(2.2046 lb/kg)(ton/2,000 lb) = 9.876 ton/yr
h: 12.46(0.6)(11)(66)/536 (0.1/100) = 0.0101 lb sulfur/1,000 gal = 0.0101 (64.06/32.06) = 0.0202 lb/1,000 gal
i: (0.0202 lb/1,000 gal)(4,800 gal/min)(min/60 sec)(1,000 g/kg)(kg/2.2lb) = **0.734 g/sec**
j: (0.734 g/sec)(3,600 sec/hr)(kg/1,000 g)(2.2 lb/kg) = **5.813 lb/hr**
k: (0.0202 lb/1,000 gal)(236,520,000 gal/yr)(ton/2,000 lb) = **2.389 ton/yr**

6.2 Potential emissions from the tank farm were based on storing motor gasoline worst-case with Reid vapor pressure of 11.5 and a 243,747,000 gallon per year throughput that is over the 236,520,018 gallon/yr throughput limit specified in the permit for loading the various gasoline products. Vapor mass fractions of components for naphtha were multiplied by the total VOC emissions to determine HAP emissions worst-case. Emissions were not estimated from tanks storing Jet A, diesel, and fuel oil because these tanks are insignificant activities. Potential emissions from the tank farm are shown in Enclosure (2) and summarized below.

Tank Farm Emissions				
Pollutant	**Tank No. 5**	**Tank No. 12**	**Existing Tanks**	**Emissions (TPY)**
VOC	3.8	3.1	15.5	22.4
Hexane (n) [max. single HAP]	0.062	0.051	0.253	0.366
HAPs	0.117	0.096	0.474	0.687

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 pump seals, valves, 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 naphtha were multiplied by the total VOC emissions to determine HAP emissions. Emission estimates are shown in Enclosure (3) and summarized below as follows:

Equipment Leak Emissions				
Pollutant	**Emissions (TPY)**			**Emissions (TPY)**
	Valves	**Fittings**	**Pump Seals**	
VOC	0.066	0.075	0.021	0.162
Hexane (n) [max. single HAP]	0.001	0.001	< 0.001	0.003
HAPs	0.0019	0.0021	0.0006	0.005

6.4 Emissions of VOCs and HAPs from the modification to the terminal are shown below.

Modification Emissions			
Pollutant	**Emissions (TPY)**		**Total Emissions (TPY)**
	Tank No. 5	**Tank No. 10**	
VOC	3.8	3.1	6.9
Hexane (n) [max. single HAP]	0.062	0.051	0.113
HAPs	0.117	0.096	0.213

6.5 Worst-case yearly emissions of VOCs and HAPs from operating the Port Allen Terminal are shown below:

Facility Emissions				
Pollutant	**Emissions (TPY)**			**Emissions (TPY)**
	Load Rack	**Tank Farm**	**Equipment Leaks**	
VOC	34.6	22.4	0.2	57.2
Hexane (n) [max. single HAP]	0.563	0.366	0.003	0.9
HAPs	0.996	0.687	0.005	1.7

7. Air Quality Assessment

7.1 No changes to the permit are proposed for this modification that increase emissions from the vapor combustion system. Emissions from the vapor combustion system are based on the combustion of gasoline worst-case. As such, an air modeling assessment is not required for this review.

8. Significant Permit Conditions

8.1 Add denatured ethanol to the 5,631,429 barrel per year total combined throughput limit for aviation gasoline, motor gasoline, and naphtha/whole straight run gasoline. The denatured ethanol will be metered prior to mixing with motor gasoline.

8.2 Incorporate NSPS, Subpart Kb regulations for Tank Nos. 5 and 12 based on tank modifications to store denatured ethanol or gasoline worst-case.

9. Conclusion and Recommendation

9.1 The bottom loading load rack is equipped with a vapor combustion system to control VOC emissions. Additional air pollution control is provided by internal floating roofs and tank seal systems for the five permitted tanks at the facility to control VOCs. The total combined throughput of motor gasoline and naphtha loaded at the terminal at the end of December of 2004 was 664,741 barrels which is far below the 5,631,429 barrel/yr total combined throughput limit for motor gasoline, aviation gasoline, and naphtha/whole straight run gasoline. For calendar year 2004, no aviation gasoline was loaded. Recommend issuance of the permit with changes pending 30-day public comment period and 45-day review by EPA.

Mike Madsen 8-17-2005