PROPOSED

PERMIT APPLICATION REVIEW
COVERED SOURCE PERMIT NO. 0079-01-C
Renewal Application No. 0079-03

Applicant: Chevron Products Company
Facility: Hilo Marketing Terminal
Located At: 666 Kalanianaole Street, Hilo, Hawaii

***Mailing Address:** 91-480 Malakole Street
Kapolei, Hawaii 96707

Coordinates: UTM: 284,700 meters East and 2,182,560 meters North (load rack)

Responsible Official: Mr. Gary J. Cushnie
Title: Area Manager Operations
Phone: (808) 682-3106
Address: *See Above

Contact: Mr. Richard Rosen
Title: Health Environmental Safety Specialist
Phone: (808) 682-3125
Address: *See Above

1. Background.

1.1 Chevron Products Company has applied for a renewal to their covered source permit for The Hilo marketing terminal. Products distributed at the terminal include motor gasoline (mogas) that is mixed with ethanol, high and low sulfur diesel, jet fuel, and fuel oil No. 6. Product is delivered to the terminal by barge. The terminal does not distribute aviation gasoline (avgas), however provisions will remain in the permit for loading this product for flexibility. Avgas is not distributed at the terminal because current procedure is to distribute avgas and mogas separately to prevent lead contamination of the mogas. Avgas is transported by barge in special tanks that can be hooked to a tank truck for transport to the airport. The terminal has a bottom loading load rack equipped with a vapor combustion system to control volatile organic compound (VOC) emissions. The load rack has two tank truck loading lanes with a total of 11 load arms and is limited to a total combined mogas and avgas throughput of 985,522 barrels per year (41,391,924 gallons/yr). The terminal is also limited to a total combined product throughput of 3,600 gallons per minute based on the vapor combustion system's capacity. Storage vessels to be permitted at the facility include Tank Nos. 2, 3, 9, 10, 15, and 17 that require internal floating roofs and tank seal systems to control VOCs. The terminal has one top loading load rack to load dedicated tank trucks for supplying fuel oil No. 6 to power plants on the island. It was indicated that the fuel oil No. 6 has enough fluidity for transport at ambient temperatures and does not need to be heated. The top loading load rack is not connected to the vapor combustion system. The facility has recently been altered to blend ethanol with gasoline. The Standard Industrial Classification Code for this terminal is 5171 (Petroleum Bulk Stations and Terminals – Whole Sale).

1.2 It was requested by Mr. Rosen that Tank No. 8 be removed from the permit. Tank No. 8 has been removed from gasoline service and presently has no internal floating roof.

1.3 A site inspection of the Chevron terminal was conducted on February 23, 2006. Information from pictures taken during the inspection are shown in Enclosure (1). Additional information from the inspection is listed as follows:

a. The terminal will be equipped with 1,000 gallon and 150 gallon portable proover tanks to verify the quantity of ethanol being blended at the load rack. The 1,000 gallon tank will be connected to the vapor combustion system during verification. The 150 gallon tank will not be connected to the vapor combustion system during verification.

b. Load arms by color designation for the bottom loading load rack are described as follows from right lane as facing the Tesoro terminal across the street from Chevron: (black) Jet A, (blue) mid-grade, (red) supreme, (white) regular unleaded, and (yellow) high sulfur diesel.

c. Load arms by color designation for the bottom loading load rack are described as follows from left lane as facing the Tesoro terminal across the street from Chevron: (yellow) high sulfur diesel, (white) regular unleaded, (red) supreme, (blue) mid-grade (yellow) low sulfur diesel, (black) Jet A.

d. The denatured ethanol is limited to 5% water content because 0.5% water in the gasoline/ethanol blend will cause ethanol to drop out of the gasoline. The state requirement is a 90% gasoline to 10% ethanol blend and 5% water content in a a 10% ethanol blend is 0.5%. Ethanol has a high affinity for water and an increase in density occurs when ethanol combines with water that causes the ethanol to drop out of the gasoline. If ethanol drops out of the gasoline, the octane of the fuel will drop if the gasoline is refined with a lower octane to counteract a raise in octane that occurs when blending ethanol with gasoline.

e. A single mechanical shoe seal was installed for the internal floating roof that will be servicing Tank No. 10.

f. Tank No. 9 is permitted to store gasoline worst-case. The tank has no seals and is currently out of service.

g. The serial number of the John Zink vapor combustion system is 3843-1.

h. The TAC for the vapor combustion system is 900356/800461.

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
    - §11-60.1-31 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 Tanks permitted at the terminal were constructed prior to those dates that would require applicability to 40 Code of Federal Regulation (CFR), Part 60, New Source Performance Standards (NSPS), Suparts K, Ka, or Kb. Also, it was indicated in correspondence by Chevron that the up-grades to Tank No. 10 are not expected to trigger reconstruction or modification for purposes of applicability to NSPS. The time at which permitted tanks were constructed ranges from 1938 to 1960.

2.3 The bottom loading load rack is subject to 40 CFR, Part 60 – 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	**Emissions (TPY)**	**CERR Triggering Levels (TPY)**	
		1 year cycle (Type A sources)	**3 year cycle (Type B sources)**
VOC	21.8	≥ 100	≥ 100
NO_X	0.7	≥ 2,500	≥ 100
CO	1.7	≥ 2,500	≥ 1,000
SO_2	3.9	≥ 2,500	≥ 100
PM-10	0.87	≥ 250	≥ 100
PM-2.5	0.70	≥ 250	≥ 100

2.6 A best available control technology analysis (BACT) analysis is required for new sources or modifications to existing sources that would result in a significant emissions increase as defined in HAR, Section 11-60.1. Because there are no modifications for this permit renewal that increase emissions, BACT is not applicable.

2.7 The purpose of Compliance Assurance Monitoring (CAM) is to provide reasonable assurance that compliance is being achieved with large emissions units that rely on air pollution control device equipment to meet an emissions limit or standard. Pursuant to 40 CFR, Part 64, for CAM to be applicable, the emissions unit must: (1) be located at a major source; (2) be subject to an emissions limit or standard; (3) use a control device to achieve compliance; (4) have potential pre-control emissions that are 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, Subpart XX and has potential pre-control emissions greater than the major source level for VOCs, CAM is not applicable to the load rack because the terminal is not a major source.

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

2.9 The facility is not a major source for hazardous air pollutants (HAPs) and is not subject to national emission standards for HAPs or maximum achievable control technology standards under 40 CFR, Parts 61 and 63.

2.10 The facility is a synthetic minor source because the throughput limitation of 41,391,924 gallons per year restricts emissions below major source thresholds. Maximum capacity of the terminal is 3,600 gallons per minute (1,892,160,000 gal/yr) based on the capacity of the vapor combustion system.

3. Insignificant Activities

3.1 The following is a list of insignificant activities at the terminal. Tanks listed in (a) through (h) and emissions from sources in (o) through (s) are exempt in accordance with HAR §11-60.1-82(f)(7). Tanks listed in (i) through (n) are exempt pursuant to HAR §11-60.1-82(f)(1).

a. 11,000 barrel vertical fixed cone roof Tank No. 1 storing diesel;
b. 3,300 barrel vertical fixed cone roof Tank No. 6 storing jet fuel;
c. 6,000 barrel vertical fixed cone roof Tank No. 7 storing diesel;
d. 1,400 barrel vertical fixed cone roof Tank No. 8 out of service;
e. 4,700 barrel vertical fixed cone roof Tank No. 11 storing jet fuel;
f. 14,000 barrel vertical fixed cone roof Tank No. 12 storing fuel oil;
g. 19,600 barrel vertical fixed cone roof Tank No. 13 storing fuel oil;
h. 11,300 barrel vertical fixed cone roof Tank No. 16 storing fuel oil;
i. 600 barrel vertical fixed cone roof Tank No. 18 storing transmix;
j. 500 gallon transmix tank;
k. 179 barrel horizontal fixed roof additive Tank No. 22;
l. 250 gallon propane tank;
m. 1,000 gallon proover tank;

n. 150 gallon proover tank;
o. AFL oil water separator;
p. 9,600 gallon concrete sump;
q. Top loading fuel oil tank truck loading rack;
r. Diesel and jet fuel filter draining; and
s. Equipment leaks.

4. Alternate Operating Scenarios

4.1 No alternate operating scenarios were proposed by the applicant.

5. Project Emissions

5.1 Potential emissions from the bottom loading load rack with vapor combustion system were based on the following:

a) Maximum permitted throughput of 985,522 bbls/yr (41,391,924 gal/yr);
b) Loading gasoline into tank trucks as worst-case scenario;
c) Control of VOCs with vapor combustion system operating in accordance with the federal requirement not to exceed more than 35 mg of total organic compound per liter of gasoline loaded;
d) A VOC emission factor of 8 mg/liter for leakage from tank truck when loading tank trucks based on a November 7, 2001 memo regarding EPA Emission Factors for Tank Truck Loading
e) Emission factors for NO_X and CO of 4 mg/l and 10 mg/l, respectively;
f) Emission factors for PM and SO_2 for commercial boilers were taken from AP-42 (10/96), Section 1.5, Liquefied Petroleum Gas Combustion because there are no emission factors for the combustion of gasoline or diesel vapors from loading tank trucks (manufacturer indicated that primary pollutants from gasoline vapor combustion are CO and NO_X);
g) Per manufacturer's information a 53,000,000 Btu/hr heat rate input flare capacity was used based on maximum vapor flow rate to combustor of 481 cfm, a 1,389 Btu/ft^3 heating value for gasoline vapor at saturation, and a maximum truck loading rate of 4,800 gpm instead of 3,600 gpm. Available literature indicates a 53,000,000 Btu/hr capacity for the vapor combustion system, however, it was indicated that the maximum capacity of the vapor combustion system is 3,600 gpm. A value of 53,000,000 Btu/hr will be used to determine emission rates of PM and SO_2 worst case. The pollutants were not evaluated in the previous review because no emission factors were provided;
h) A 90,500 Btu/gal heating value for propane based on AP-42 (10/96), Section 1.5 information;
i) Information from the gas company that maximum sulfur content of propane is 185 ppm (see permit file No. 0351-01);
j) Pursuant to AP-42(9/85), Appendix A, there are 15.432 grains per gram;
k) Information from the gas company that indicates the gas specific gravity of propane is 1.54;
l) The density of air at standard temperature and pressure is 0.075 lb/ft^3, therefore (1.54 – sg)(0.075 lb/ft^3) = (0.115 lb/ft^3)(kg/2.2 lb)(100/100) = 5.23 kg/100 ft^3
m) Maximum truck loading design capacity for the vapor combustion system of 3,600 gal/min;

n) Vapor mass fractions of pollutants for gasoline were multiplied by the total VOC emissions to determine HAP emissions; and

o) Potential VOC/HAP emissions are summarized as follows:

Pollutant	Vapor Mass Fraction	Emissions		
		lb/hr	g/s	TPY
VOC	----------	----------	----------	7.5[a]
NO_X	----------	7.2[b]	0.909	0.7[c]
CO	----------	18.0[d]	2.27	1.7[e]
SO_2	----------	0.9[f,g]	0.114	3.9
PM	----------	0.2[h]	0.029	1.0
PM-10	----------	----------	----------	0.9
PM-2.5	----------	----------	----------	0.7
Benzene	0.0021	----------	----------	0.015
Ethylbenzene	0.0003	----------	----------	0.002
Hexane (n)	0.0073	----------	----------	0.055
Toluene	0.0063	----------	----------	0.047
Xylene (m)	0.0010	----------	----------	0.008
Xylene (o)	0.0004	----------	----------	0.003
Xylene (p)	0.0004	----------	----------	0.003
			Total HAPs--->	0.133

a: (35 mg/liter)(41,391,924 gal/yr)(liter/2.64 x 10^{-1} gal)(10^{-3} g/mg)(kg/1,000g)(2.2 lb/kg)(ton/2,000 lb) = 6.036 TPY VOC for vapor combustion unit

(8 mg/liter)(41,391,924 gal/yr)(liter/0.246 gal)(10^{-3} g/mg)(kg/1,000 g)(2.2046 lb/kg)(ton/2,000 lb) = 1.484 TPY

b: (3,600 gal/min)(4 mg/liter)(liter/2.64 x 10^{-1} gal)(10^{-3} g/mg)(kg/1,000g)(2.2 lb/kg)(60 min/hr) = 7.2 lb/hr NO_X
c: (4 mg/liter)(41,391,924 gal/yr)(liter/2.64 x 10^{-1} gal)(10^{-3} g/mg)(kg/1,000g)(2.2 lb/kg)(ton/2,000 lb) = 0.690 TPY NO_X
d: (3,600 gal/min)(10 mg/liter)(liter/2.64 x 10^{-1} gal)(10^{-3} g/mg)(kg/1,000g)(2.2 lb/kg)(60 min/hr) = 18 lb/hr CO
e: (10 mg/liter)(41,391,924 gal/yr)(liter/2.64 x 10^{-1} gal)(10^{-3} g/mg)(kg/1,000g)(2.2 lb/kg)(ton/2,000 lb) = 1.725 TPY CO
f: 185 g S/1,000 kg)(15.432 grains/g)(5.239 kg/100 ft^3) = 14.96 grains/100 ft^3; therefore emission factor is (0.1)(14.96) = 1.496 lb/1,000 gallons propane
g: (53,000,000 Btu/hr)(gal/90,500 Btu)(1.496 lb/1,000 gal) = 0.88 lb/hr SO_2
h: (53,000,000 Btu/hr)(gal/90,500 Btu)(0.4 lb/1,000 gal) = 0.23 lb/hr PM
i: Based on AP-42(1/95), Appendix B, Table B.2.2 that indicated 87% of cumulative particulate is PM-10.
j: Based on AP-42(1/95), Appendix B, Table B.2.2 that indicated 70% of cumulative particulate is PM-2.5.

5.2 Internal floating roof tank emissions were determined with EPA's Tanks 4.0 program. Emissions were based on tank throughputs ranging from 21,435 gal/yr to 97,285,585 gal/yr. The bottom loading load rack is limited to a total combined throughput of 985,522 bbls/yr (41,391,924 gal/yr). It was assumed that the tanks handle mogas as worst-case. Vapor mass fractions of pollutants from data for mogas were multiplied by the total VOC emission to determine HAP emissions. Potential VOC/HAP emissions are summarized as follows:

Internal Floating Roof Tank Emissions								
Pollutant	**Vapor Mass Fraction**	**Emission (TPY)**						**Total Emissions (TPY)**
		Tank 2	**Tank 3**	**Tank 9**	**Tank 10**	**Tank 15**	**Tank 17**	
VOC	----------	3.48	4.51	0.35	1.37	2.32	2.24	14.3
Benzene	0.0021	0.007	0.009	0.001	0.003	0.005	0.005	0.030
Ethyl benzene	0.0003	0.001	0.001	0.001	0.0004	0.001	0.001	0.005
Hexane	0.0073	0.025	0.033	0.003	0.010	0.017	0.016	0.104
Toluene	0.0063	0.022	0.028	0.002	0.009	0.015	0.014	0.090
Xylene (-m)	0.0010	0.003	0.005	0.0004	0.001	0.002	0.002	0.013
Xylene (-o)	0.0004	0.001	0.002	0.0001	0.001	0.001	0.001	0.006
Xylene (-p)	0.0004	0.001	0.002	0.0001	0.001	0.001	0.001	0.006
							Total HAPs→	0.254

5.4 Worst-case yearly emissions of VOCs and HAPs from permitted facilities are as follows:

Facility Emissions			
Pollutant	**Emissions (TPY)**		**Total Emissions (TPY)**
	Bottom Loading Load Rack	**Internal Floating Roof Tanks**	
VOCs	7.5	14.3	21.8
NO_x	0.7	---------	0.7
CO	1.7	---------	1.7
HAPS	0.133	0.254	0.4

6. Air Pollution Controls

6.1 Emissions from the bottom loading load rack are controlled by a model no. ZCT-2-8-35-X-2/8-X-X John Zink vapor combustion system. Maximum specified tank truck loading rate for the vapor combustion system is 3,600 gallons per minute. Minimum specified loading rate for the vapor combustion system is 500 gallons per minute.

6.2 Tank Nos. 2, 3, 9, 10, 15, and 17 are equipped with internal floating roofs and tank seal systems for controlling VOC and HAP emissions.

7. Air Quality Assessment

7.1 An ambient air quality impact assessment was performed for SO_2 and PM-10 because these pollutants were not evaluated in the previous review because there were no emission factors provided by the applicant for these pollutants. It was assumed that worst-case emissions of these pollutants would be from the combustion of propane. Screen3 modeling from the previous permit application review predicted a 1 hour model output of 23.04 ug/m^3 per g/s based on the following:

a. Simple terrain impacts
b. Rural dispersion parameters;
c. Wake effects from Tank No. 1 (50 ft diameter and 35 feet height);
d. Default meteorology;
e. Default receptor placement from 1 to 50,000 meters; and

f. EPA scaling factors 0.9, 0.4, and 0.2 for the 3-hour, 24-hour, and annual concentrations, respectively.

7.2 Background concentrations used for the assessment for PM-10 and SO_2 were collected in 2004 from the Hilo air quality monitoring station.

7.3 The table below presents the emission rates and stack parameters used for the AAQIA.

SOURCE		EMISSION RATES		STACK PARAMETERS	
Equipment	Stack No.	PM-10 (g/s)	SO_2 (g/s)	Height (ft)	Heat Rate Input (Btu/hr)
Vapor Combustion System	1	0.2	0.9	40	53,000,000

7.4 The predicted concentrations in the table below were based on full capacity operation of the flare burning propane at 53,000,000 Btu/hr worst-case. Based on these assumptions, the vapor combustion system will comply with state and federal air quality standards.

PREDICTED AMBIENT AIR QUALITY IMPACTS						
AIR POLLUTANT	AVERAGING TIME	IMPACT(ug/m^3)	BACKGROUND (ug/m^3)	TOTAL IMPACT (ug/m^3)	AIR STANDARD	PERCENT STANDARD
SO_2	3 –Hour	19	427	446	1,300	34
	24 – Hour	8	107	115	365	32
	Annual	4	7	11	80	14
PM_{10}	24 – Hour	2	29	31	150	21
	Annual	1	13	14	50	28

8. Significant Permit Conditions

8.1 The total combined throughput of the bottom loading load rack shall not exceed 985,522 barrels of motor gasoline and aviation gasoline per any rolling twelve-month (12-month) period.

8.2 The total combined product throughput of the bottom loading load rack shall not exceed 3,600 gallons per minute.

Reason for 8.1 and 8.2: These are conditions carried over from the previous permit. The limit in 8.1 is the maximum throughput proposed for determining maximum potential emissions. The limit in 8.2 is based on the capacity specified for the vapor combustion system.

8.3 Emissions to the atmosphere from the vapor combustion system shall not exceed thirty-five milligrams of total organic product per liter (35 mg/l) of gasoline loaded.

Reason for 8.3: This condition is an emissions limit required by NSPS, 40 CFR, Part 60, Subpart XX.

9. Conclusions and Recommendation

9.1 Actual emissions from the facility should be less than those estimated. Actual gasoline throughput at the terminal for calendar year 2005 was 14,460,000 gallons per year which is 35% of the 41,391,924 gallon per year throughput limit specified in the permit. No avgas was loaded at the terminal during calendar year 2005. The terminal is equipped with a vapor combustion system to control VOC emissions from tank truck loading operations. The internal floating roofs and tank seals systems installed for permitted tanks will provide additional VOC control. Air modeling assessments of the vapor combustion system show compliance with the air standards. Recommend issuance of the permit subject to incorporation of the significant permit conditions. The 30-day public comment period and 45-day review by the Environmental Protection Agency will be initiated simultaneously.

Mike Madsen 3-22-2006