



**SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT**  
**ENGINEERING AND COMPLIANCE DIVISION**

ENGINEERING EVALUATION REPORT

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 APPL. NO. 380595&475142  
 PROCESSED BY Yan Yang  
 CHECKED BY  
 DATE 6/27/2011

PC to PO Evaluation

**COMPANY NAME:** Chevron Products Company  
 El Segundo Refinery

**MAILING ADDRESS:** 324 W. El Segundo Blvd.  
 El Segundo, CA 90245

**EQUIPMENT LOCATION:** 324 W. El Segundo Blvd.  
 El Segundo, CA 90245

**CONTACT PERSON:** R. Mélida Escalante-Henricks  
 Permitting Engineer  
 Health, Environmental and Safety Department

SECTION D: FACILITY DESCRIPTION AND EQUIPMENT SPECIFIC CONDITIONS

**EQUIPMENT DESCRIPTION:**

The equipment under Process 14/System 28 will be moved from Section H to Section D in the Title V permit. The current listed equipment under this system in Section D will be deleted. Additions and deletions are noted in underlines and ~~strikeouts~~, respectively.

Equipment	ID No.	Connected To	RECLAIM Source Type	Emission* And Requirements	Conditions
<b>Process 14 : LOADING AND UNLOADING</b>					P13.1
<b>System 28: LPG/PENTANE LOADING/UNLOADING</b>					S7.2, <del>S15.3</del> , S31.15
LOADING AND UNLOADING ARM, RAIL CAR, PENTANE, LPG, WITH VAPOR BALANCE OR RETURN LINE, 5 TOTAL; DIAMETER: 4 IN A/N: 475142 <del>Permit to Construct Issued: 06/06/08</del>	D3777				C1.84, D90.35, E71.18, K67.25
<del>KNOCK OUT POT, V 755, WITH EMERGENCY PRESSURE RELIEF VALVE VENTED TO ISOMAX VAPOR RECOVERY SYSTEM, HEIGHT: 4 FT ; DIAMETER: 2 FT A/N: 475142 Permit to Construct Issued: 06/06/08</del>	<del>D4265</del>				
<b><u>FUGITIVE EMISSIONS, MISCELLANEOUS</u></b> A/N: 475142	<u>Dxxxx</u>			<b><u>HAP: (10) [40CFR 63 Subpart CC, #5A, 6-23-2003]</u></b>	<u>H23.3</u>



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**- CONDITIONS -**

New are noted in bold & underlines. Additions are noted in bold and deletions in strikeouts.

**PROCESS CONDITIONS:**

P13.1 All devices under this process are subject to the applicable requirements of the following rules or regulations:

Contaminant	Rule	Rule/Subpart
Benzene	40CFR61, SUBPART	FF

**[40CFR 61 Subpart FF, 12-4-2003]**

[Processes subject to this condition : 14]

**SYSTEM CONDITIONS:**

S7.2 The following conditions shall apply to all refinery operation and related devices from this system:

The operator shall comply with all applicable mitigation measures stipulated in the "Statement of Findings, Statement of Overriding Considerations, and Mitigation Monitoring Plan" document which is part of the AQMD Certified Final Environmental Impact Report dated 30-Nov-2001 for this facility.

[CA PRC CEQA, 11-23-1970]

[Systems subject to this condition : Process 3, System 5; Process 4, System 3 , 4; Process 8, System 8; Process 14, System 28]

S15.3 The vent gases from all affected devices of this process/system shall be vented as follows:

All vent gases under normal operating conditions shall be directed to the LPG Vent Gas Vapor Recovery System.

This process/system shall not be operated unless the vapor recovery system is in full use and has a valid permit to receive vent gases from this system.

**[RULE 1303(a)(1)-BACT, 5-10-1996; RULE 1303(b)(2)-Offset, 5-10-1996]**

[Systems subject to this condition: ~~Process 14, System 28~~]

S31.15 The following BACT requirements shall apply to VOC service fugitive components associated with the devices that are covered by application number(s) 378811, 380595, 380596, 380597, 380611, 385372, 385373, 385374 and 475142:

The operator shall provide to the District, no later than 60 days after initial startup, a recalculation of the fugitive emissions based on actual components installed and removed from service. The valves and flanges shall be categorized by size and service. The operator shall submit a listing of all new non-bellows seal valves which shall be



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categorized by tag no., size, type, operating temperature, operating pressure, body material, application, and reasons why bellows seal valves were not used.

All new valves in VOC service, except those specifically exempted by Rule 1173, shall be bellows seal valves, except as approved by the District, in the following applications: heavy liquid service, control valve, instrument piping/tubing, applications requiring torsional valve stem motion, applications where valve failure could pose safety hazard (e.g., drain valves with valve stems in horizontal position), retrofits/special applications with space limitations, and valves not commercially available.

All new valves and major components in VOC service as defined by Rule 1173, except those specifically exempted by Rule 1173 and those in heavy liquid service as defined in R1173, shall be distinctly identified from other components through their tag numbers (e.g., numbers ending in the letter "N"), and shall be noted in the records.

All new components in VOC service as defined in Rule 1173, except valves and flanges, shall be inspected quarterly using EPA reference Method 21. All new valves and flanges in VOC service, except those specifically exempted by Rule 1173, shall be inspected monthly using EPA Method 21. If 98.0 percent or greater of the new (non-bellows seal) valves and the new flange population inspected is found to leak gaseous or liquid volatile organic compounds at a rate less than 500 ppmv for two consecutive months, then the operator may change to a quarterly inspection program with the approval of the District.

The operator shall revert from quarterly to monthly inspection program if less than 98.0 percent of the new (non-bellows seal) valves and the new flange population inspected is found to leak gaseous or liquid volatile organic compounds at a rate less than 500 ppmv.

All new components in VOC service with a leak greater than 500 ppmv but less than 1,000 ppmv, as methane, measured above background using EPA Method 21 shall be repaired within 14 days of detection. Components shall be defined as any valve, fitting, pump, compressor, pressure relief valve, diaphragm, hatch, sight-glass, and meter, which are not exempted by Rule 1173.

The operator shall keep records of the monthly inspection (quarterly where applicable), subsequent repair, and reinspection, in a manner approved by the District. Records shall be kept and maintained for at least five years, and shall be made available to the Executive Officer or his authorized representative upon request.

**[RULE 1303(a)(1)-BACT, 5-10-1996; RULE 1303(b)(2)-Offset, 5-10-1996]**

[Systems subject to this condition : Process 1, System 18; Process 3, System 5; Process 4, System 3 , 4; Process 8, System 8; Process 14, System 28; Process 16, System 8 , 10]

**DEVICE CONDITIONS:**

**C. Throughput or Operating Parameter Limits**



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C1.84 The operator shall limit the throughput to no more than 540000 barrel(s) in any one calendar month.

[**RULE 1303(b)(2)-Offset, 5-10-1996**]  
 [Devices subject to this condition: D3777]

**D. Monitoring/Testing Requirements**

D90.35 The operator shall monitor the throughput of this device according to the following specifications:

The throughput shall be derived by using engineering calculations using parameters obtained from process records, purchase records, shipping invoices, manual tank level gauging, etc.

Records of throughput shall be retained for a period of five years and made available to the Executive Officer upon request.

[**RULE 1303(b)(2)-Offset, 5-10-1996; RULE 3004(a)(4)-Periodic Monitoring, 12-12-1997**]  
 [Devices subject to this condition: D3777]

**E. Equipment Operation/Construction Requirements**

E71.18 The operator shall only operate this equipment if it is connected to a vapor return or balance system.

[**RULE 1303(b)(2)-Offset, 5-10-1996**]  
 [Devices subject to this condition: D3777]

**H. Applicable Rules**

H23.3 This equipment is subject to the applicable requirements of the following rules or regulations:

Contaminant	Rule	Rule/Subpart
VOC	District Rule	1173

[**RULE 1173, 5-13-1994; RULE 1173, 2-6-2009**]  
 [Devices subject to this condition: D3657, **Dxxxx**]

**K. Record Keeping/Reporting**

K67.25 The operator shall keep records, in a manner approved by the District, for the following parameter(s) or item(s):

Amount of pentane and LPG loaded in barrels per calendar month.

~~Records shall be kept and maintained for at least two years, and shall be made available to the Executive Officer or his authorized representative upon request. Once the Title V permit is issued, records shall be maintained for five years.~~

[**RULE 1303(b)(2)-Offset, 5-10-1996; RULE 3004(a)(4)-Periodic Monitoring, 12-12-1997**]

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[Devices subject to this condition: D3777]

**COMPLIANCE RECORD REVIEW:**

The AQMD’s compliance database shows that Chevron El Segundo Refinery has been cited with 8 Notices of Violation and three Notices to Comply within the last two years. **Appendix A** includes a list of the citations. Two NOVs were issued to the LPG (Liquefied Petroleum Gas) Loading/Unloading and LPG/Pentane Loading/Unloading systems during the 2011 Chevron Blue Sky Inspection for the light service leak in excess of 50,000 ppm. All of the NOVs and NCs have been resolved to the satisfaction of the Executive Officer.

**BACKGROUND:**

Chevron Products Company, El Segundo Refinery submitted AN 380595 for the addition of Pentane Loading Facilities/Rail Car Staging in January 26, 2001. A modified application package for this project was submitted on August 30, 2001. The Permit to Construct (PC) was issued on January 23, 2002. This project was part of the CARB Phase 3 Clean Fuel project, which required the removal of pentane from gasoline blending streams to reduce the vapor pressure of the gasoline. The installation of a Pentane Rail Car Loading Facility would facilitate the movement of excess pentanes from the refinery. The new Pentane Rail Car Loading Facility (Process 14, System 28) started operation since February of 2003. It has 5 loading stations and can accommodate 5 railcars; however, only one railcar is loaded at any one time. There are two loading hoses per loading station and they are 2” in diameter. The size of the loading arm is 4” in diameter. The pump P-720A/B transfers pentane from the storage sphere tank T-718 to the rail car. The loading rate is 18,000 BPD (540,000 BPM or 750 BPH), which is equivalent to load one rail car per hour. The PFD of the rack is included in **Appendix B**.

On October 25, 2007, Chevron submitted six applications for their LPG/Pentane Rack Segregation Project. One of the applications AN 475142 was to modify the Pentane Rail Car Loading (Process 14, system 28). In this application, Chevron proposed to install C<sub>5</sub> Drain Pot vessel called V-755 (device D4265), which was to prevent significant amounts of pentane from entering the LPG/Pentane vapor balance lines if personnel improperly operates pentane railcar the loading rack. The PC was issued on June 6, 2008. However, this part of the project was cancelled, and the vessel was not installed. There were also two other changes requested by Chevron under AN 475142. One of them was to add unloading capability to this rail car loading rack. According to Chevron, the refinery had been using this rack to unload pentane for some time before Chevron submitted the application. The refinery ships pentane into and out of the refinery based on needs. The loading and unloading of materials from the storage sphere (T-718) have to be accomplished through these loading racks. Since the emission of the unloading process is the same as the loading process, unloading of the materials from T-718 was also added to the PC. Because the storage sphere T-718 was permitted to store not only pentane, but also *n*-butane and isobutene, the refinery requested to add LPG (such as *n*-butane and isobutene) to the service of this loading/unloading rack. The PC was approved for the refinery to load/unload pentane and LPG by the rack. Table 1 shows the actual modifications made to the LPG/Pentane Loading/Unloading System under ANs 380595 and 475142.

**Table 1. Modifications to LPG/Pentane Loading/Unloading Systems**



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Application No.	System	Status	Type	Modifications
380595	Pentane Rail Car Loading	26	10	<ul style="list-style-type: none"> <li>Added Pentane Loading Facilities/Rail Car Staging to move excess pentanes from the refinery</li> </ul>
475142	LPG/Pentane Loading/Unloading	26	50	<ul style="list-style-type: none"> <li><del>Install new knockout pot V-755. The new knockout pot's PRD will be tied to Isomax Vapor Recovery Systems.</del></li> <li>Added LPG to the service of the rack.</li> <li>Added unloading capability. No physical modification will be required for adding unloading capability.</li> </ul>

**PERMIT CONDITION COMPLIANCE REVIEW**

Non-BACT (Bellows Seal) Valves

A combined list of non-bellows valves categorized by location, type, size, accessibility, and service was submitted on April 22, 2003 (for AN 380595, Pentane Rail Car Loading and AN 380596, Pentane Storage Sphere) per Condition S31.15. There were 123 non-Bellow Sealed valves installed by Chevron under the two applications. All of the non-BACT valves were exempted for the reasons approved by the District. There was no major physical modification under AN 475142.

LPG/Pentane Loading/Unloading Throughput

The throughput record from September, 2010 to August, 2011 was submitted by Chevron per Condition K67.25 and is shown in Table 2 and **Appendix C**. This facility has been used to load/unload LPG and Pentane. The total amount of LPG and Pentane loaded/unloaded has been below the limit set in Condition C1.84, which is 540,000 barrels per calendar month.

**Table 2. LPG/Pentane throughput**

Month	LPG (Barrels)	Pentane (Barrels)	Total (Barrels)
9/1/2010	42,686.63	7,148.88	49,835.51
10/1/2010	29,001.90	0.00	29,001.90
11/1/2010	32,958.81	0.00	32,958.81
12/1/2010	31,584.91	0.00	31,584.91
1/1/2011	66,158.62	5,751.50	71,910.12
2/1/2011	51,421.43	4,336.83	55,758.26
3/1/2011	99,655.12	26,338.57	125,993.69
4/1/2011	280,854.78	7,642.60	288,497.38
5/1/2011	139,924.96	59,049.03	198,973.99
6/1/2011	37,245.12	35,361.66	72,606.78
7/1/2011	42,576.57	0.00	42,576.57
8/1/2011	35,344.00	0.00	35,344.00



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**EMISSIONS:**

Criteria Pollutant Emissions

1. Application AN 380595—New Construction of a Pentane Rail Car Loading Facility

The main emissions from the Pentane Rail Car Loading system are the VOC emissions from the fugitive components and emissions occurred during the loading process. Emission from the loading process occurs when the loading hose is disconnected from the railcar after the loading process is completed and N<sub>2</sub> purges the hose.

a. Fugitive Emissions

The emission increase estimated for the installation of the new Pentane Rail Car Loading system was estimated to be 1.6 lb/day from a total of 129 fugitive components calculated using the old emission factors developed by CARB Reformulated Fuels Projects (1993). Using the new emission factors developed in the California Implementation Guidelines for Estimating Mass Emissions of Fugitive Hydrocarbon Leaks at Petroleum Facilities (CARB/CAPCOA 1999), the emission increase would be equivalent to 1.93 lb/day as shown in Table 3.

On April 22, 2003, Chevron submitted a final net fugitive emission calculation sheet for both constructions of the Pentane Storage Sphere (AN 380596) and the Pentane Rail Car Loading (AN 380595). The combined emission increase for these two permit units was 14.44 lb/day calculated using the old emission factors. The counts for flanges and connectors were given as a total, not individually because the same emission factor applies for both component types. When AN 475142 was submitted on January 25, 2008 for the modification to the Pentane Rail Car Loading Facility, the pre-modification fugitive component count for the loading/unloading rack alone equals to 306 fugitive components, which gave a VOC emissions of 3.24 lbs/day (or 1165.5 lb/year) using the old emission factors.

On November 16, 2011, Chevron informed the District that the physical modification proposed under AN 475142—installation of a new knock pot—had been cancelled. Therefore, there was no change to the fugitive component count for the LPG/Pentane Loading/Unloading Facility under AN 475142. An update of the fugitive emission baseline calculation sheet was also submitted to the District. The revived fugitive component count equaled 373 instead of 306. The only difference between the two counts was the number of the connectors serving light liquid/vapor—67 more connectors were counted in the later time. This most recent fugitive count will be the PTE emission for the Pentane Rail Car Loading (AN 380595). As shown in Table 3, the emissions equal to 1656.03 lb/year and 4.60 lb/day using the new emission factor. The fugitive component counts provided by Chevron are included in **Appendix D**.



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**Table 3. VOC Fugitive Emissions for Pentane Rail Car Loading Facility (AN 380595)**

Source Unit		Service	Emission Factor lb/yr	PC Emissions		PO Emissions	
				Component added	Emission lb/yr	Component all	Emission lb/yr
Valves	Sealed bellows	All	0	14		35	
	Live loaded with dual seal system or low emission valves ≤ 500 ppm	Gas/Vapor	4.55	13	59.09	2	9.09
		Light Liquid	4.55	8	36.37	41	186.38
		Heavy liquid	4.55	0		0	
Pumps	Single mechanical seal with flush cooling	Heavy liquid	46.83	0		0	
Flanges	ANSI/API standards	All	6.99	81	566.20	150	1048.53
Connectors		All	2.86	12	34.34	144	412.04
PRVs	Closed vent system	All	0	1	0	1	
Total				<b>129</b>		<b>373</b>	
Annual Emission, lbs/yr					696.00		1656.03
Hourly Emission = (Annual)/(52×7×24), lb/hr					0.08		0.19
Daily Maximum= (Annual)/(52×7), lbs/day					1.91		4.55
30-day Average = (Annual)/(12×30), lbs/day					<b>1.93</b>		<b>4.60</b>

Operating schedule: 52 weeks/year, 7 days/week, 24 hours/day

b. Disconnection Emissions

Chevron estimated the loading/unloading (disconnection) emissions equal to 0.31 lb/rail car. The calculations incorrectly assumed the number of railcars to be one per day. The actual loading rate equals one rail car per hour. Therefore, the loading/unloading loss equals  $0.31 \times 24 = 7.44$  lb/day.

c. Total emission

The total emission increase for the Pentane Loading Facilities/Rail Car Staging Project (AN 380595) will be updated to 12.04 lbs/day instead of 1.91 lbs/day as estimated in the PC evaluation. It should be noted that there is 0.33 lb/day (1.93 lb/day - 1.6 lb/day) increase due solely to the use of new emission factors.

2. Application AN 475142—Modifications of the Pentane Rail Car Loading Facility

a. Fugitive emission

The modification proposed in AN475142 was cancelled. Therefore, there is no change in the fugitive emission for the LPG/Pentane Loading/Unloading system.

b. Disconnection emission

The emission of the unloading operation is essentially the same as loading process. Therefore, there was no emission increase to add the unloading capability to the rail car loading system. However, since the vapor pressure of LPG (*n*-butane and isobutane) is much higher than pentane, the loading loss PTE emissions due to the disconnection of the hose from the rail car should be based on loading or unloaded of LPG.

The PTE for the LPG/Pentane Loading/Unloading Facility is determined assuming loading/unloading only isobutane for an entire year since isobutane has the highest vapor pressure among butanes and pentanes. Assuming the line to the vapor recovery system is blocked off when the pressure in the hose reaches 5 psig (20 psia); the volume of the loading line is approximately  $3.5 \text{ ft}^3$  (40 ft of 4" inside diameter pipe) the highest temperature in the summer is 100 °F; and the hose is full of butane when it



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is disconnected, the number of *lbmol* of Isobutane in the hose can be calculated using the equation below:

$$n = \frac{20 \text{ psia} \cdot 3.5 \text{ ft}^3}{R \cdot 100F} = \frac{20 \text{ psia} \cdot 3.5 \text{ ft}^3}{10.73 \frac{\text{psia} \cdot \text{ft}^3}{^\circ\text{R} \cdot \text{lbmol}} \cdot 559.67^\circ\text{R}} = 0.012 \text{ lbmol}$$

$$\text{Emission} = 0.012 \text{ lbmol} \cdot 58 \frac{\text{lb}}{\text{lbmol}} = 0.68 \text{ lb}$$

Therefore, the emission of isobutane is 0.012 lbmol and 0.68 lb per rail car.

$$\text{EmissionIncrease} = (0.68 - 0.31) \frac{\text{lb}}{\text{railcar}} \cdot 24 \frac{\text{railcar}}{\text{day}} = 8.88 \frac{\text{lb}}{\text{day}}$$

Therefore, the VOC emission increase for adding LPG service to the previously pentane only rack equals 8.88 lb/day and shown in Table 5.

c. Total emission

The PTE VOC emission for the LPG/Pentane Loading/Unloading System is 20.92 lb/day shown in Table 5.

**Table 5. VOC Fugitive Emissions for Pentane Rail Car Loading Facility (AN 475142)**

	<b>Pentane</b>	<b>Isobutane</b>	<b>Increase</b>	<b>Post-Mod</b>
Annual Emission, lbs/yr	2678.4	5875.2	3196.8	7531.23
Hourly Emission = (Annual)/(52×7×24), lb/hr	0.31	0.68	0.37	0.86
Daily Maximum = (Annual)/(52×7), lbs/day	7.44	16.32	8.88	20.69
30-day Average = (Annual)/(12×30), lbs/day	7.44	16.32	8.88	20.92

Operating schedule: 52 weeks/year, 7 days/week, 24 hours/day

Toxic Air Contaminant (TAC) Emissions and Health Risk Assessment (HRA)

**1. AN 380595**

No TACs, as listed in Rule 1401, was identified in the pentane material loaded by the rack for the PC evaluation for this application. According to Chevron, pentane loaded by the Pentane Rail Car Loading facility consists of 1.83% *n*-butane, 10.61% *n*-pentane and 87.55% isopentane and 0.01% cyclopentane. As a result, this system was not subject to Rule 1401 and no HRA was performed in the engineering evaluation.

For AN 475142 submitted on January 21, 2008, Mr. Peter Allen of Chevron, however, provided TAC speciation for both LPG and pentane for (see **Appendix E**). The speciation profiles came from the AB2588 Toxic Hot Spots Emission Inventory. They were based on “snapshot” lab data of these streams, which meant the materials were sampled and tested once or a few times for a specific purpose rather than sampled and tested on a regular basis. As shown in Table 6 below, the TACs in pentane included benzene, ethylbenzene, *n*-hexane, naphthalene, toluene, and xylene. Table 6 shows the liquid weight fraction of TACs in the pentane stream loaded by the rack. Assuming the weight percentage of

the TACs emitted to the atmosphere are the same as the ones in the liquid phase, the emission of TACs are calculated and shown in Table 6.

**Table 6. TAC Emissions from Loading of Pentane by Loading Rack**

	Benzene	Ethylbenzene	n-Hexane	Naphthalene	Toluene	Xylene	Total
<b>Weight (%)</b>	1.7	0.03	1.52	0.01	0.13	0.10	3.49
<b>Emission (lb/yr)</b>	73.69	1.3	65.88	0.43	5.63	4.33	-

The health risk assessment Tier 2 is performed for the Pentane Rail Car Loading facility loading Pentane using the TAC speciation profile described in Table 6. The distances to the nearest residential and commercial receptors are assumed to be 350 m and 250 m, respectively (equipment location map included in **Appendix F**). As shown in Table 7, the MICR at the nearest residential site is  $9.68 \times 10^{-7}$ , which is below one in a million limit. The MICR at the commercial site is  $3.47 \times 10^{-7}$ , also below one in a million. The non-cancer chronic/acute HI are below the rule threshold as well. Tier II calculations can be found in the **Appendix G**.

**Table 7. Pentane Loading/Unloading 1401 Health Risk Assessment Tier 2 Report**

	Pentane loading/unloading	
	Residential	Commercial
Distance to nearest receptor (m)	350	250
MICR	$9.68 \times 10^{-7}$	$3.47 \times 10^{-7}$
	PASS	PASS
Max. HIA	$3.33 \times 10^{-4}$	$5.82 \times 10^{-4}$
Target organ system	DEV&REP	DEV&REP
	PASS	PASS
Max. HIC	$5.68 \times 10^{-4}$	$1.04 \times 10^{-3}$
Target organ system	NS	NS
	PASS	PASS

## 2. AN 475142

Since the only modification to the equipment permitted in AN 475142 was to allow this system to unload and to add LPG to the rack's service. Based on the same AB2588 speciation data provided by Chevron, the LPG contains 0.0052% by liquid weight of 1,3-butadiene, which is a Rule 1401 TAC. The health risk increases from the modifications to the rack are calculated assuming the rack will be in LPG service for an entire year. Consequently, the emission rate of 1,3-butadiene equals to 0.39 lb/yr ( $0.0052/100 \times 7531.23$  lbs/yr). Tier 1 screening threshold for 1,3-butadiene at 100 meter to a nearest sensitive receptor equals 1.49 lb/yr. This equipment passes Tier I HRA.



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**RULE EVALUATION:**

**PART 1: SCAQMD REGULATIONS**

**Rule 212: Standards for Approving Permits and Issuing Public Notice**

*Amended*  
11/14/97

The Pentane Rail Car Loading, later changed to LPG/Pentane Loading/Unloading system is not located within 1000 feet of a school. The construction of the Pentane Rail Car Loading system permitted under AN 380595 resulted in a VOC emission increase of 9.37 lb/day. A public notice was sent out because it was associated with a significant project with expected direct operational total VOC emission increase of 140.7 lb/day. Adding LPG to the Pentane Loading system permitted under AN 475142 resulted in a VOC emission increase of 8.88 lb/day and is less than 30 lb/day threshold specified in Rule 212(g)(2). The MICR and hazard indices are not expected to be greater than the limits specified in Rule 212(c)(3) for the receptors outside of the refinery. Therefore, a public notice is not required.

**Rule 401: Visible Emissions**

*Amended*  
11/9/01

The LPG/Pentane Loading/Unloading systems are not expected to result in visible emissions under normal operating conditions. Compliance is expected.

**Rule 402: Nuisance**

*Adopted*  
5/7/76

Nuisance complaints are not expected under normal operating conditions. Compliance is expected.

**Rule 462 Organic Liquid Loading**

*Amended*  
5/14/99

LPG is excluded from organic liquids per paragraph (b)(11), the definition of the organic liquid. So when the facility loads/unloads LPG, it is not subject to this rule. In the PC evaluation of AN 380595 for this system, it was discussed that pentane met the definition of LPG since pentane (mainly *iso*-pentane and some *n*-pentane) had to be stored and loaded under an elevated pressure in order to keep it in the liquid form at the actual operating condition. Therefore, when the facility loads/unloads pentane, it is not subject to this rule either. In fact, it is discussed in the Emission section that the loading emission for pentane is much less than the loading emission for LPG. It was further discussed based on the loading procedure and use of a vapor balance system, the VOC emissions from the loading of the LPG and pentane should meet the 0.08 lb VOC/1000 gal limit of this rule. Submerged filling that would be followed in the loading operation should also meet the bottom loading criteria under this rule.

**Rule 467 Pressure Relief Devices** (*Amended 3/5/82*)

The refinery is subject to Rule 1173. Pursuant to Rule 1173 (l)(3), these rules do not apply to these components for these facilities.

**Rule 1173: Control of Volatile Organic Compound Leaks and Releases from Components at Petroleum Facilities and Chemical Plants**

*Amended*  
6/1/07

Chevron has an on-going Leak Detection And Repair (LDAR) program to meet all applicable requirements of the rule, such as: Identification Requirements (e), Operator



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Inspection Requirement (f), Maintenance Requirements (g), Atmospheric Process PRD Requirements (h), Recordkeeping and Reporting Requirements (i), and Test Methods.

Two counts of leak (light service leak in excess of 50,000 ppm) were found in LPG Loading/Unloading and LPG/Pentane Loading/Unloading systems during the 2011 Chevron Blue Sky Inspection. NOVs were issued and the repairs were completed on the same day.

**REG XIII**

**New Source Review**

1301

General

Amended  
12/7/95

The modifications of LPG/Pentane Loading/Unloading systems cause the issuance of VOC at the refinery. Therefore, they are subject to this rule.

1303

Requirements

Amended  
12/6/02

Best Available Control Technology (BACT)

The construction of the Pentane Rail Car Loading system resulted in an increase of VOC emission about 9.37 lb/day. Therefore, any new or replacement fugitive components to be installed on this system are required to have BACT. After the completion of the construction, a combined list of non-BACT valves was submitted to the District on April 22, 2003. All of the non-BACT valves were exempted for the reasons approved by the District. No physical modification was required to add LPG to the LPG/Pentane Loading/Unloading system.

Offset

For AN 380595, see the evaluation of Rule 1304.

For AN 475142, Chevron is required to provide Emission Reduction Credits (ERCs) of 11 lb/day (8.88×1.2) to offset the VOC emission increases to allow the additional service of LPG for the Pentane Loading/Unloading system. All of the ERCs provided by Chevron are originated from zone 1 as required by the sensitive zone requirements of Rule 1303(b)(3).

1304

Exemptions

Amended  
6/14/96

The emission increase due to the construction of the Pentane Rail Car Loading system was exempt from offset per Regulatory Compliance section in Rule 1304 (c)(4).

**Rule 1401**

**New Source Review of Toxic Air Contaminants**

Amended  
3/4/05

The LPG/Pentane Loading/Unloading system could emit benzene, ethyl benzene, hexane, toluene, xylene, and 1,3-butadiene which are toxic air contaminants listed in Table 1 of Rule 1401. Therefore, the facility is subject to all applicable requirements of this rule. The application for the modification was deemed completed on December 1, 2007. As a result, the facility is subject to the version of this rule that was amended on March 4, 2005.

MICR and Cancer Burden

The post-modification MICR for residential and commercial receptors does not exceed the Tier II HRA Screening tests and are expected to be less than one in a million.



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Cancer burden does not need to be determined because the MICR is below one in a million.

Chronic/Acute Hazard Index

The cumulative increases in total chronic and acute hazard indices for this facility do not exceed the Tier II HRA Screening tests and are less than one for any receptor locations.

The LPG/Pentane Loading/Unloading system is expected to comply with all applicable requirements of this rule.

**REG XVII Prevention of Significant Deterioration (PSD)**

*Amended  
8/13/99*

The proposed project will only impact VOC emissions at this facility. VOC is not an attainment pollutant for the South Coast Air Basin. Therefore, PSD analysis is not required.

**REG XXX Title V**

Chevron El Segundo Refinery is subject to Reg XXX and a Title V permit for the facility was issued on September 1, 2009. Adding LPG to the Pentane Loading system permitted under AN 475142 resulted in a VOC emission increase of 8.88 *lb/day*. The cumulative emission increase of VOC from the De Minimis Significant revisions previously issued for Chevron will be 19.6 *lb/day* which is not greater than 30 *lb/day* threshold level. Therefore, this issuance of the final PO permits to the LPG/Pentane Loading/Unloading is a De Minimis Significant Permit Revision under Rule 3000. Accordingly, the proposed revision is subject to the 45 day EPA review process, not public noticing requirements under Rule 3006.

**PART 2: STATE REGULATIONS**

**CEQA California Environmental Quality Act**

The installation of the Pentane Rail Car Loading system was part of a project considered to be significant and required a CEQA EIR document. The modifications to the Pentane Rail Car Loading system permitted under AN 475142 have no possibility to cause a significant adverse effect on the environment. Therefore, the expected impacts of the project on the environment are not significant and preparation of an Environmental Impact Report (EIR) is not required.

**PART 3: FEDERAL REGULATIONS**

**40CFR 60 STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES**

**Subpart Standards of Performance for Equipment Leaks of VOC in Petroleum Refineries for which Construction, Reconstruction, or Modification Commenced After January 4, 1983, and on or Before November 7, 2006**

**GGG**

The equipment including valves, pumps, pressure relief devices, sampling connectors, open-ended valves or lines in the other unit are not subject to this subpart because they are not equipment within a "process unit" as defined by section § 60.590 (e). Per Effective Date Note in §60.591, the definition of "process unit" in this section was



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stayed until further notice. While the definition of “process unit” is stayed, owners or operators should use the definition in § 60.590 (e) which do not include any feed, intermediate and final product *storage vessels* (except as specified in §60.482–1a(g)), *product transfer racks*, and connected ducts and piping.

**Subpart GGGa Standards of Performance for Equipment Leaks of VOC in Petroleum Refineries for Which Construction, Reconstruction, or Modification Commenced After November 7, 2006**

The equipment including valves, pumps, pressure relief devices, sampling connectors, open-ended valves or lines in the other unit are not subject to this subpart because they are not equipment within a “process unit” as defined by section § 60.590a (e). Per Effective Date Note in §60.591a, the definition of “process unit” in this section was stayed until further notice. While the definition of “process unit” is stayed, owners or operators should use the definition in § 60.590a (e) which do not include any feed, intermediate and final product *storage vessels* (except as specified in §60.482–1a(g)), *product transfer racks*, and connected ducts and piping.

**40CFR 63 NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR SOURCE CATEGORIES**

**Subpart CC National Emission Standards for Hazardous Air Pollutants From Petroleum Refineries**

It was determined that Dxxxx (Miscellaneous Fugitive Emissions, in Process 14, system 28) contains fugitive leak components that are in “organic HAP service” as defined at §63.641 of this regulation. So the LPG/Pentane Loading/Unloading system is subject to this regulation. It is required to comply with the requirements described in the Section J in the Facility Permit under 40CFR 63 Subpart CC, #5A 6-23-2003. Continued compliance with these requirements is expected.

**Subpart EEEE National Emission Standards for Hazardous Air Pollutants: Organic Liquids Distribution (Non-Gasoline)**

Per § 63.2406, the definition of **Organic Liquids** applying to this subpart is “Any non-crude oil liquid or liquid mixture that contains 5 percent by weight or greater of the organic HAP listed in Table 1 to this subpart”. LPG contains 0.0052% of 1,3-butadiene and Pentane contains a total of 3.49% of benzene, ethylbenzene, *n*-hexane, naphthalene, toluene, and xylene. Since the organic liquids (LPG and Pentane) which are transferred into and out of the refinery through the loading/unloading racks contain less than 5 percent of the organic HAP, the LPG/Pentane Loading/Unloading system is not subject to this subpart.

**RECOMMENDATION/CONCLUSION:**

Issue Permit to Operate for the LPG/Pentane Loading/Unloading system subject to the conditions indicated on pages 2 to 5.

### **List of Appendices in Evaluation:**

- A Compliance History
- B Pentane Rack PFD
- C Monthly LPG/Pentane Throughput
- D Fugitive Emissions Counts
- E TAC Speciation in LPG and Pentane
- F Map of LPG/Pentane Loading/Unloading Rack and  
Its Nearest Residential and Commercial Sites
- G Tier II Health Risk Assessment for Pentane  
Loading/Unloading

# **APPENDIX A**

## Compliance History

## **APPENDIX B**

Pentane Rack PFD

## **APPENDIX C**

Monthly LPG/Pentane Throughput

## **APPENDIX D**

### Fugitive Emissions Counts

## **APPENDIX E**

TAC Speciation in LPG and Pentane

## **APPENDIX F**

Map of LPG/Pentane Loading/Unloading Rack and  
Its Nearest Residential and Commercial Sites

## **APPENDIX G**

Tier II Health Risk Assessment  
for Pentane Loading/Unloading

**PC Evaluation See Folder AN 475136**