

**SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT**

*ENGINEERING & COMPLIANCE*

**APPLICATION PROCESSING AND CALCULATIONS**

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APPL. NO.  
465660

DATE  
December 10, 2009

PROCESSED BY:  
Connie Yee

CHECKED BY:  
*[Signature]*

**PERMIT TO CONSTRUCT**

**COMPANY NAME, LOCATION ADDRESS**

Ultramar Inc. Facility ID. 800026  
2402 E. Anaheim Street  
Wilmington CA 90744-4081

**EQUIPMENT DESCRIPTION**

Section D of the Ultramar's Facility Permit: All changes are new since this is a new construction.

Equipment	ID No.	Connected To	RECLAIM Source Type/ Monitoring Unit	Emissions and Requirements	Conditions
<b>Process 10: TREATING/STIPPING</b>					
<b>System 13: FUEL GAS TREATING UNIT 88</b>					<b>S4.6, S13.2, S15.12, S31.5</b>
<u>MIXER, INLINE, STATIC, CAUSTIC, 88-MX-1</u> A/N: 465660	D1642		(new)		
<u>VESSEL, KNOCKOUT DRUM, CAUSTIC WASH, 88-V-1, DIAMETER: 5 FT, HEIGHT: 14 FT</u> A/N: 465660	D1643		(new)		
<u>MIXER, INLINE, STATIC, WATER WASH, 88-MX-2</u> A/N: 465660	D1644		(new)		
<u>VESSEL, KNOCKOUT DRUM, WATER WASH, 88-V-2, DIAMETER: 4 FT, HEIGHT: 12 FT</u> A/N: 465660	D1645		(new)		
<u>VESSEL, DEGASSING DRUM, SPENT CAUSTIC, 88-V-3, DIAMETER: 2 FT 6 IN, HEIGHT: 7 FT</u> A/N: 465660	D1646		(new)		
<u>MIXER, INLINE, STATIC, MAKE-UP CAUSTIC, 88-MX-3</u> A/N: 465660	D1647		(new)		
<u>TANK, SPENT CAUSTIC, 40-TK-01, DIAMETER: 26 FT, HEIGHT: 23 FT</u> A/N: 465660	D682	C1648	(Previously in A/N 255995/D60406: Tail Gas Unit 39; tank was removed from this permit unit a while ago)		
<u>CARBON FILTER, TWO CANISTERS IN SERIES, 400 LBS CARBON PER CANISTER</u> A/N: 465660	C1648	D682	(new)		D90.14, E128.1, E153.1
<u>FUGITIVE EMISSIONS, MISCELLANEOUS</u> A/N: 465660	D1649		(new)	HAP: (10) [RULE 63SUBPART CC, #5A, 06/23/03]	H23.16

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**SYSTEM CONDITIONS**

- S4.6 The following condition(s) shall apply to all affected devices listed under Sections D and H of this system for fugitive emissions of Volatile Organic Compounds (VOC):

All components are subject to District Rule 1173 and 40CFR60, Subpart GGG.

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.

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

All new valves greater than 2-inch size and major components in VOC service as defined by Rule 1173, except those specifically exempted by Rule 1173 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 valves in VOC service except those specifically exempted by Rule 1173, shall be bellow-sealed valves for 2-inch and smaller size, except 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), and retrofits with space limitation.

If 98.0 percent or greater of the new valve and the new flange population inspected is found to leak gaseous or liquid volatile organic compounds at a rate less than 500 ppm for two consecutive months, then the operator shall revert to a quarterly inspection program with the approval of the executive officer.

The operator shall keep records of the monthly inspection (and quarterly where applicable), subsequent repair, and reinspection, in a manner approved by the District.

[RULE 1173, 5-13-1994; RULE 1173, 6-1-2007; RULE 1303(a)(1)-BACT, 5-10-1996; RULE 1303(a)(1)-BACT, 12-6-2002; 40CFR60, Subpart GGG, 6-2-2008]

]

[Systems subject to this condition: Process 4, System 5; Process 10, System 1, 10, 11, 13]

- S13.2 All devices under this system are subject to the applicable requirements of the following rules or regulations:

Contaminant	Rule	Rule/Subpart
VOC	District Rule	1123

[RULE 1123, 12-07-1990]

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[Systems subject to this condition: Process 1, System 1, 3, 5; Process 2, System 1, 3, 5; Process 3, System 1; Process 4, System 1, 3, 5, 7; Process 5, System 1; Process 7, System 1, 3; Process 8, System 1, 2, 3, 4, 5; Process 9, System 1; Process 10, System 1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13; Process 11, System 1, 2; Process 17, System 46, 50, 97]

S15.12 The vent gases from all affected devices of this process/system shall be vented as follows:

All emergency vent gases shall be directed to a blowdown vapor recovery system and/or blowdown flare system.

When the emergency vent gases are being directed to the blowdown vapor recovery system, this process/system shall not be operated unless the blowdown vapor recovery system is in full use and has a valid permit to receive vent gases from this system.

When the emergency vent gases are being directed to the blowdown flare system, this process/system shall not be operated unless the blowdown flare 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(a)(1)-BACT, 12-6-2002; RULE 1303(b)(2)-Offset, 05-10-1996; RULE 1303(b)(2)-Offset, 12-6-2002]**

[Systems subject to this condition: Process 1, System 1, 3, 5; Process 2, System 1, 3, 5; Process 3, System 1; Process 4, System 1, 3, 5, 7; Process 5, System 1; Process 7, System 1, 3; Process 8, System 1, 2, 3, 4; Process 9, System 1; Process 10, System 1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13; Process 13, System 1; Process 14, System 5, 6; Process 17, System 46, 50, 88, 97]

S31.5 The following BACT requirements shall apply to VOC service fugitive components associated with the devices that are covered by application number(s) 416627 (Unit 43), 416624 (Unit 56), 416622 (Unit 68), 416626 (Unit 69), 416633 (Unit 82-V-9), and 416628 (Unit 86-B-9003), and 465660 (Unit 88):

All open-ended lines shall be equipped with cap, blind flange, plug, or a second valve.

All pressure relief valves shall be connected to closed vent system or equipped with rupture disc.

All process drain shall be equipped with water seal, or a closed-vent system and control device complying with the requirements of 40CFR60 Subpart QQQ section 60.692-5.

All sampling connections shall be closed-purge, closed-loop, or closed-vent system.

All valves in VOC service shall be of leakless type, except those specifically exempted by Rule 1173 or approved by the District in the following applications: heavy liquid service, control valves, instrument piping/tubing, applications requiring torsional valve stem motion, applications where failures could pose safety hazards (e.g. drain valves with valve stems in horizontal position), retrofits with space limitations, and valves not commercially available at the time of Permit to Construct issuance.

For the purpose of this condition, leakless valve shall be defined as any valve equipped with sealed bellow or equivalent as approved in writing by the District prior to installation. Components shall be

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defined as any valve, flange, fitting, pump, compressor, pressure relief device, diaphragm, hatch, sight-glass, meter, and any instrumentation which are not exempted by Rule 1173.

All components in VOC service, except valves and flanges shall be inspected quarterly using EPA reference method 21. All valves and flanges in VOC service except those specifically exempted by Rule 1173 shall be inspected monthly using EPA method 21.

All components in VOC service, a leak greater than 500 ppm but less than 1,000 ppm measured as methane above background using EPA Method 21, shall be repaired within 14 days of detection. A leak greater than 1,000 ppm shall be repaired according to Rule 1173.

If 98.0 percent or greater of the new valve and flange population inspected is found to leak gaseous or liquid VOC at a rate less than 500 ppm for two consecutive months, then the operator may revert to a quarterly inspection program with the approval of the Executive Officer. This condition does not apply to leakless valves.

The operator shall keep records of the monthly inspection (and quarterly where applicable), subsequent repair, and reinspection, in a manner approved by the District.

[**RULE 1303(a)(1)-BACT, 5-10-1996; RULE 1303(a)(1)-BACT, 12-6-2002; RULE 1303(b)(2)-Offset, 05-10-1996; RULE 1303(b)(2)-Offset, 12-6-2002**]

[Systems subject to this condition: Process 4, System 7; Process 7, System 1, 3; Process 8, System 4; Process 10, System 13; Process 14, System 5, Process 15, System 4]

## **DEVICE CONDITIONS**

### **D. Monitoring/Testing Requirements**

D90.14 The operator shall periodically monitor the VOC concentration at the outlet of the carbon canister according to the following specifications:

The operator shall monitor at least once per month.

The operator shall use an appropriate analyzer in accordance with EPA Test Method 21 to monitor the parameter.

The operator shall calibrate the instrument use to monitor the parameter to ppmv methane.

[**RULE 1303(a)(1)-BACT, 5-10-1996; RULE 1303(a)(1)-BACT, 12-6-2002; RULE 1303(b)(2)-Offset, 05-10-1996; RULE 1303(b)(2)-Offset, 12-6-2002**]

[Devices subject to this condition: C1648]

### **E. Equipment Operation/Construction Requirements**

E128.1 The operator shall keep all spent carbon in a tightly covered container which shall remain closed except when it is being transferred into or out of the container.

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[**RULE 1303(a)(1)-BACT, 5-10-1996; RULE 1303(a)(1)-BACT, 12-6-2002; RULE 1303(b)(2)-Offset, 05-10-1996; RULE 1303(b)(2)-Offset, 12-6-2002**]

[Devices subject to this condition: C1648]

E153.1 The operator shall change over the carbon in the adsorber whenever breakthrough occurs.

For the purpose of this condition, breakthrough occurs when the hydrocarbon monitor reading indicates a concentration of 500 ppmv at the outlet of the operating carbon adsorber.

[**RULE 1303(a)(1)-BACT, 5-10-1996; RULE 1303(a)(1)-BACT, 12-6-2002; RULE 1303(b)(2)-Offset, 05-10-1996; RULE 1303(b)(2)-Offset, 12-6-2002**]

[Devices subject to this condition: C1648]

**H. Applicable Rules**

H23.16 This equipment is subject to the applicable requirements of the following rules or regulations:

Contaminant	Rule	Rule/Subpart
VOC	District Rule	1173
VOC	40CFR60, SUBPART	GGG

[**RULE 1173, 5-13-1994; RULE 1173, 6-1-2007; 40CFR60, Subpart GGG, 6-2-2008**]

[Devices subject to this condition: D594, D708, D1327, D1328, D1342, D1351, D1363, D1364, D1649]

**COMPLIANCE RECORD REVIEW**

A check of the AQMD Compliance Database shows that the facility has received 19 Notices of Violation since January 1, 2007. None of the NCs or NOV's apply to Unit 88 since this is a new unit.

**BACKGROUND**

In 2003, Ultramar embarked on the Alkylation Improvement Project. The purpose of the project was to replace its current alkylation process with a modified HF alkylation process referred to as Reduced Volatility Alkylation Process (ReVAP) thereby eliminating the use of concentrated HF as a catalyst in the alkylation process. ReVAP incorporates a suppressant in the HF that greatly reduces its volatility. For details on the history of this project, please refer to the master application A/N 416622 – Alkylation Unit.

Ultramar submitted 17 applications in 2003 to modify and construct various process units for the proposed Alkylation Improvement Project. The Permits to Construct for all these applications were

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issued on December 16, 2004 and listed in Appendix A. One component of the proposed project was to increase the refinery's demand for refinery fuel gas by 655 mmBtu/hr (due to the addition of one-245 mmBtu/hr boiler, A/N 416628; addition of one-350 mmBtu/hr hot oil heater, A/N 416634; and an increase in duty by 60 mmBtu/hr for hot oil heater 56-H-2, A/N 419147). Ultramar, therefore, proposed installing a new fuel gas treating system (Unit 88) under A/N 416632 to treat the fuel gas for these additional combustion sources as well as other sources which consume fuel gas. See A/N 416632 for more details on this original proposed fuel gas treating unit.

After the additional engineering was performed and Permits to Construct were issued, Ultramar realized they would not be constructing the 350 mmBtu/hr hot oil heater and increasing the duty for the hot oil heater 56-H-2. As a result, they constructed a fuel gas treating system quite different than that originally permitted because less fuel gas would be consumed. Since the Unit # 88 constructed was a significant departure from that permitted under A/N 416632, the District requested that Ultramar submit a new application for the Fuel Gas Treating Unit and cancel A/N 416632. Therefore, Ultramar submitted the following applications to permit the Fuel Gas Treating Unit # 88:

**Table 1. AQMD Applications Submitted**

A/N	Date Submitted	Deem Complete Date	Equipment	Type	Status	Previous A/N
465660	Feb 20, 2007	April 19, 2007	Fuel Gas Treating Unit 88	10	21	n/a
502108	Sept 2, 2009	Nov 3, 2009	Facility Permit Amendment	87	21	n/a

**FEE SUMMARY**

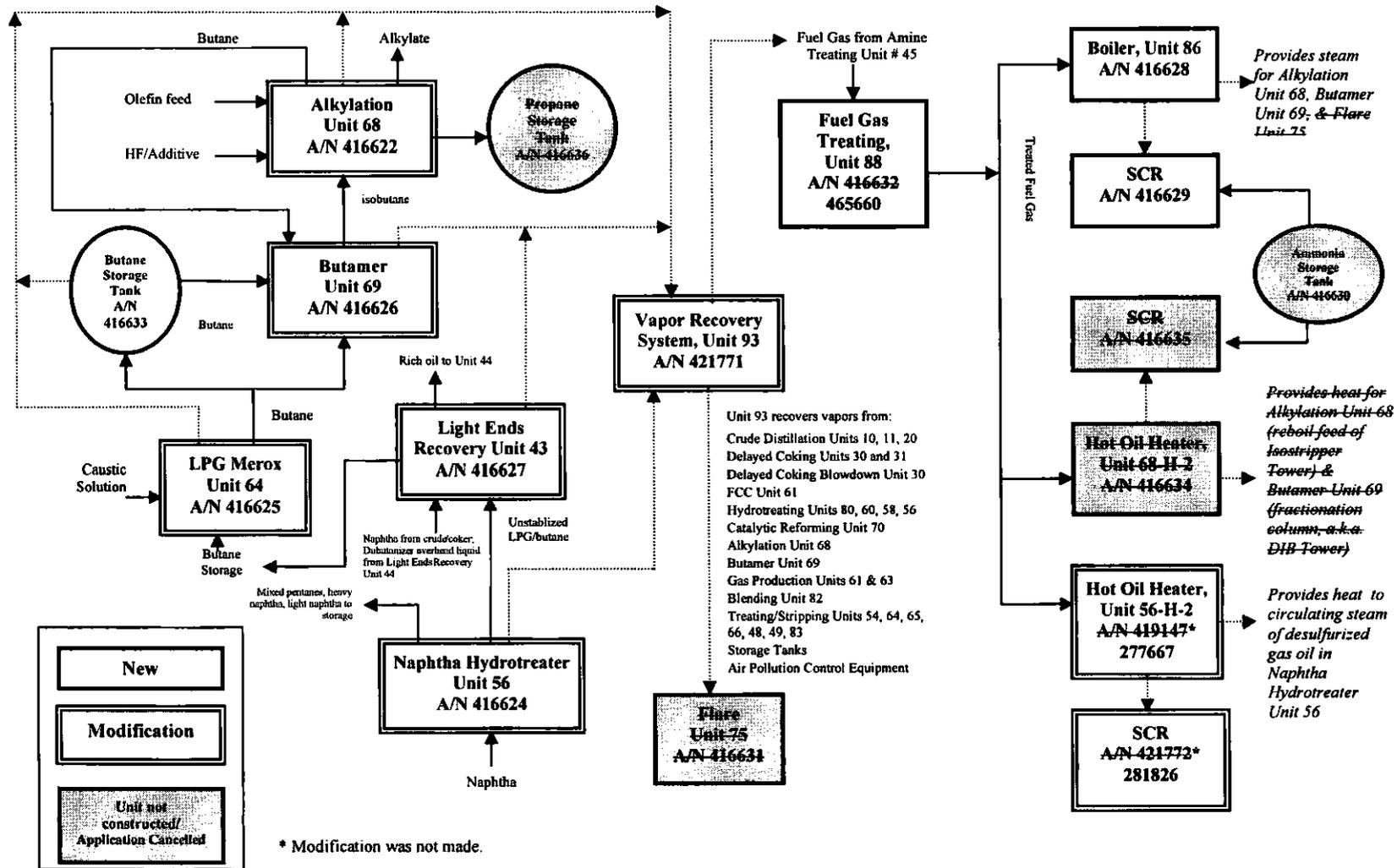
**Table 2. Fee Summary**

A/N	Equipment	Type	Schedule	Fee Required, \$	Fee Submitted, \$
465660	Fuel Gas Treating Unit 88	10	D	\$5,551.88	\$5,551.88
502108	RECLAIM/Title V Significant Permit Revision	87	n/a	\$1,687.63	\$1,687.63

**PROCESS DESCRIPTION:**

Refer to Figure 1 for an overall diagram of the affected units due the Alkylation Improvement Project. Unit 88 is a new fuel gas treating system constructed to remove/reduce the sulfur content of the additional fuel gas to be consumed and produced as a result of the Alkylation unit improvements. The fuel gas fed to Unit 88 is initially treated in Amine Treating Unit # 45 [Process 10, System 12].

Figure 1. Alkylation Improvement Project (Revised)



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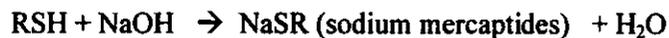
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Unit 45 removes a bulk of the H<sub>2</sub>S from the fuel gas. However, other sulfur compounds (approximately 600 ppmv), such as mercaptans, may remain in the partially treated fuel gas. The Unit 88 Fuel Gas Treating unit thus further removes H<sub>2</sub>S and other sulfur compounds to ensure the treated fuel gas contains less than 100 ppmv total sulfur before the gas is introduced into the fuel gas system.

Appendix B contains the process flow diagram for Unit 88. The sulfur compounds are removed from fuel gas using a caustic solution followed by simple phase separation. The fuel gas from Amine Treating Unit #45 is mixed with a caustic solution via a static inline mixer (88-MX-1). Unit 88 is designed to handle approximately 13 mmscfd or 541,667 scfh of feed gas from Unit 45. The caustic reacts with the sulfur compounds in the fuel gas to produce water and sodium sulfide or sodium mercaptides, which are water-soluble and stay in solution. The H<sub>2</sub>S and mercaptan (RSH) removal process is represented by the following reactions:



Simple phase separation occurs in the caustic wash knockout drum (88-V-1). Cleaned fuel gas exits the top of the vessel, while the sodium sulfide/sodium mercaptides-enriched caustic solution exits the bottom. The cleaned fuel gas next is mixed with water in the water wash static mixer (88-MX-2) to ensure the removal of any entrained caustic particles. This fuel gas/water mixture is then separated in the water wash knockout drum (88-V-2), in which the clean fuel gas leaves the top of the vessel and the wash water exits the bottom of the vessel. The clean fuel gas then enters the refinery fuel gas system to be used by the refinery gas users (e.g., boilers, heaters) and/or Air Products. The treated fuel gas is equipped with a total sulfur analyzer. The daily average total sulfur concentration between January 1 to August 31, 2009 was 54.29 ppm. During this time period, there were a total of 9 days (out of 242 days) in which the sulfur concentration was between 81 ppm and 93 ppm. The lowest concentration recorded during this time period was 5.93 ppm on January 25, 2009.

There are two circulation loops in the system: caustic recirculation loop around knockout drum 88-V-1 and a wash water recirculation loop around knockout drum 88-V-1. These circulation loops provide maximum caustic utilization. The caustic is circulated from the bottom of the caustic wash knockout drum back to the caustic static mixer (88-MX-1). An analyzer monitoring for salt build-up and level controllers are used to remove spent caustic as well as add make-up caustic of the appropriate concentration as needed. Spent caustic is degassed in the spent caustic degassing drum (88-V-3) to remove any absorbed gases, and then stored in a storage tank unit to be removed by vacuum truck. The spent caustic storage tank, 40-TK-01, is equipped with a carbon filter to control tank offgases before they are emitted to the atmosphere. This carbon filter system on the spent caustic tank is a passive control system, and, therefore, does not need a separate permit.

The wash water circulation loop circulates the wash water from the bottom of the water wash knockout drum (88-V-2) back to the water wash static mixer (88-MX-2). Intermittent water flows are used to clean the demister pad at the exit of the caustic wash water drum and to dilute stored caustic to the appropriated concentration in the caustic circulation loop.

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Unit 88 consists of the equipment listed in Table 3.

**Table 3. Fuel Gas Treating System (Unit 88) Equipment List  
(Process 10, System 13)**

A/N	Action	Device Tag No.	Device ID
465660	Addition of:		
	• Mixer, Caustic	88-MX-1	D1642
	• Knockout Drum, Caustic Wash	88-V-1	D1643
	• Mixer, Water Wash	88-MX-2	D1644
	• Knockout Drum, Water Wash	88-V-2	D1645
	• Degassing Drum, Spent Caustic	88-V-3	D1646
	• Mixer, Make-up Caustic	88-MX-3	D1647
	• Tank, Spent Caustic	40-TK-01	D682
	• Carbon Filter, Two Canisters in Series		C1648
	• Fugitives		D1649

## EMISSIONS

### Fugitive Emissions

Fugitive VOC emissions from the installation of valves, flanges, drains, relief valves, and pumps are the pollutants associated with this process unit. The fugitive emissions were calculated using the Correlation Equations Method based on Screening Value (SV) of 500 ppmv [SCAQMD Guidelines for Fugitive Emissions Calculations, June 2003]. The fugitive emission counts and calculations are shown in Appendix C. The emissions attributed to fugitive emissions are listed in Table 4.

**Table 4. ROG Emissions**

Application #	ROG Emissions		
	lbs/hr	lbs/day	lbs/yr
465660	0.35	8.37	3,014

Note that the fugitive emissions calculated for A/N 465660 are less than the emissions calculated in the previous A/N 416632 since less fugitive components were installed (1,224 components vs. 374 components). The fugitives calculated in the previous A/N 416632 were based on emission factors outlined in the BACT/LAER for Valves as VOC Fugitive Sources Memorandum, dated April 2, 1999, which were the factors used in 2004. The District has since been using the more appropriate

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Correlations Equations Method. Appendix C also shows the emissions using both the 1999 Emission Factors and Correlations Equations Method based on SV 500 ppm for both the current A/N 465660 and previous A/N 416632.

**RULES EVALUATION:**

**PART 1 SCAQMD REGULATIONS**

<b>Rule 212</b>	<b>Standards for Approving Permits</b>	<b>November 14, 1997</b>
	<p>The Alkylation Improvement project was considered as a significant project due to the modifications and new equipment proposed. In accordance with Rule 219(c), a significant project is a new or modified facility in which:</p> <ul style="list-style-type: none"> <li>(1) the new or modified permit unit is located within 1000 feet of a school;</li> <li>(2) the new or modified facility has on-site emission increases exceeding the daily maximum specified in subdivision (g); or</li> <li>(3) the new or modified permit unit has an increased cancer risk greater than, or equal to, one in a million (<math>1 \times 10^{-6}</math>) during a lifetime of 70 years or pose a risk of nuisance.</li> </ul> <p>The emissions from the Alkylation Improvement Project as a whole exceeded the daily maximums specified in subdivision (g). See A/N 416622 for details on the total emissions and Appendix A for the emission summary of the units to be modified or newly installed. Therefore, prior to granting Permits to Construct for this project, a public notice was prepared by the District. This public notice was distributed to each address within a ¼ mile radius of the project, a local newspaper publication, as well as those parties listed in subdivision (g) of the rule, including EPA (Region 9), California Air Resources Board, City of Los Angeles (Wilmington), County of Los Angeles, State Land Manager, and Federal Land Manager. The public notice was distributed on <b>July 9, 2004</b> within a ¼ mile radius of the project and published on <b>July 15, 2004</b>. No comments were received.</p>	
<b>Rule 401</b>	<b>Visible Emissions</b>	<b>November 9, 2001</b>
	Visible emissions are not expected under normal operating conditions.	
<b>Rule 402</b>	<b>Nuisance</b>	<b>May 7, 1976</b>
	Nuisance complaints associated with the above project are not expected under normal operating conditions.	
<b>Rule 431.1</b>	<b>Sulfur Content of Gaseous Fuels</b>	<b>June 12, 1998</b>
	The Ultramar refinery is a SOx RECLAIM facility, and Rule 431.1 for SOx limits has	

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been subsumed per Rule 2001.

<b>Rule 1123</b>	<b>Refinery Process Turnaround</b>	<b>December 7, 1990</b>
(b) Requirements	<p>(1) During process turnarounds, the operator shall not depressurize any vessel containing organic materials unless the vapors released from the vessel are collected and contained for use as fuel or sent to a gas disposal system until the pressure in the vessel is below 5 psig, or is within 10 % above the minimum gauge pressure at which the vapors can be collected, whichever is lower.</p> <p>(2) If the refinery uses inert gas displacement or vacuum eduction for process turnaround, the refinery operator shall submit a Rule 1123 plan per Rule 1123(b)(2).</p>	
(c) Recordkeeping	<p>The operator is required to maintain a record of each refinery process unit turnaround containing at a minimum the date the unit was shut down, the approximate vessel hydrocarbon concentration when hydrocarbons were first discharged into the atmosphere, and the approximate amount of hydrocarbons emitted into the atmosphere.</p> <p>Each process unit with a vessel containing organic materials contains a system condition (S13.2) that specifies that the devices in the systems are subject to Rule 1123.</p>	

<b>Rule 1173</b>	<b>Control of Volatile Organic Compound Leaks and Releases from Components at Petroleum Facilities and Chemical Plants</b>	<b>February 6, 2009</b>
	<p>The proposed modification will add valves, flanges, pumps, pressure relief devices and drains that are subject to control of fugitive emissions. Ultramar has an approved Inspection and Maintenance (I&amp;M) Program. Ultramar has included the new components into their I&amp;M program.</p>	

<b>REG XIII</b>	<b>New Source Review</b>	<b>December 6, 2002</b>
	<p style="text-align: right;"><b>Application Deem Complete Year: April 8, 2008</b></p> <p>Fugitive VOC emissions from the installation of valves, flanges, drains, relief valves, and pumps are the pollutants associated with this process unit. As shown in Table 4, an emission increase of 8.37 lbs/day is attributed to the operation of this new unit. The following is a discussion of each requirement in NSR.</p>	
<b>BACT: 1303(a)</b>	<p>BACT has been included in the design of the proposed project. BACT means the most stringent emission limitation or control technique which:</p> <ol style="list-style-type: none"> <li>(1) has been achieved in practice for such category or class of source; or</li> <li>(2) is contained in any State Implementation Plan (SIP) approved by the US EPA for</li> </ol>	

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<b>REG XIII</b>	<p><b>New Source Review</b> <span style="float: right;"><b>December 6, 2002</b></span></p> <p style="text-align: center;"><b>Application Deem Complete Year: April 8, 2008</b></p>
	<p>such category or class of source. A specific limitation or control technique shall not apply if the owner or operator of the proposed source demonstrates to the satisfaction of the Executive Officer or designee that such limitations or control technique is not presently achievable; or</p> <p>(3) is any other emission limitation or control technique, found by the Executive Officer or designee to be technologically feasible for such class or category of sources or for a specific source, and cost effective as compared to measures as listed in the Air Quality Management Plan (AQMP) or rules adopted by the District Governing Board.</p> <p><b>Fugitive emissions.</b> BACT is required for fugitive emission control and is follows:</p> <ul style="list-style-type: none"> <li>• <b>Valves:</b> Bellow-sealed valves are required for 8-inch and smaller valves, with the following exemptions which must be included in the approved I&amp;M program,             <ol style="list-style-type: none"> <li>1. Heavy liquid service (i.e., streams with a vapor pressure &lt;0.1 psia @ 100 °F (kerosene) based on the most volatile class present &gt; 20% by volume)</li> <li>2. Control valve</li> <li>3. Instrument tubing application</li> <li>4. Applications requiring torsional valve stem motion</li> <li>5. Applications where valve failure could pose safety hazard (e.g., drain valves with valve stem in horizontal position)</li> <li>6. Retrofit/special applications with space limitation (special applications such as skid mounted standard packaged systems)</li> <li>7. Valves not commercially available (e.g., valves sizes greater than 8 inches)</li> </ol> </li> </ul> <p>Valves installed where Bellow-sealed valves are not available will be subject to a leak rate of less than 500 ppmv by EPA Method 21 and an approved I&amp;M program. According to Ultramar, a total of 67 non Bellow-sealed valves were installed. Ultramar cited the reasons for installing non Bellow-sealed valves were that the valves were torsional motion, commercially not available and size limitation, and instrument piping tubing.</p> <ul style="list-style-type: none"> <li>• <b>Relief Valves:</b> All relief valves will be connected to a closed vent system or equipped with a rupture disc.</li> <li>• <b>Process Drain:</b> Process drains will be equipped with p-traps or seal pots and included in the approved I&amp;M program.</li> <li>• <b>Pumps:</b> Pumps in light liquid service will be equipped with double or tandem seals vented to a closed system with a leak rate less than 1000 ppm by EPA Method 21 and included in an approved I&amp;M program. Pumps in heavy liquid service will include single mechanical seals with a leak rate less than 1000 ppm by EPA Method</li> </ul>

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	<p>21 and included in an approved I&amp;M program.</p> <ul style="list-style-type: none"> <li>• <b>Flanges:</b> All flanges must meet ANSI/API standards and included in an approved I&amp;M program</li> <li>• <b>Compressors:</b> No compressors were installed in this unit.</li> </ul>
<b>1303(b)(1)</b>	<p>Modeling: The emissions from the Fuel Gas Treating Unit 88 are ROG emissions. No modeling for ROG emissions is required.</p>
<b>1303(b)(2)</b>	<p>Offsets: The emission increase due to this unit is shown in Table 4. Per Rule 1303(b)(2), emission offsets are required for all emission increases associated with stationary sources, thus minimizing the impacts associated with emissions from stationary sources. However, per the requirements of Rule 1304(c)(4), offsets are not required for projects that are needed to comply with state or federal regulations provided there is no increase in rating.</p> <p>In the Memorandum of Understanding (MOU) signed in 2003, the District recognized that the construction and operation of the ReVAP unit (and the modifications to the alkylation process both to integrate the ReVAP and to make up for the gasoline volume loss due the implementation of the Phase III reformulated gasoline and the Governor's order to phase out MTBE) were "installed and modified solely to comply with District, state, or federal air pollution control laws, rules, regulations or orders, as approved by the Executive Officer or designee." A copy of the MOU is included in Appendix D. Since the proposed modifications resulted in no increase in maximum crude throughput rate at the refinery, the installation and operation of the ReVAP, the modification to the alkylation process to integrate the ReVAP, and modification to the alkylation process to improve process efficiency resulting in the increase of alkylation feed throughput to make up the gasoline volume loss to comply with CARB Phase III reformulated gasoline and the Governor's order to phase out MTBE are exempt from offsets pursuant to Rule 1304(c)(4). [Reference: MOU, Item C.8, February 12, 2003]</p>
<b>1303(b)(3)</b>	<p>Sensitive Zone Requirements. The emission increases from this project are exempt from offsets per Rule 1304(c)(4). Therefore, ERCs are not required.</p>
<b>1303(b)(4)</b>	<p>Facility Compliance. This facility complies with all applicable District rules and regulations.</p>
<b>1303(b)(5)</b>	<p>Major Polluting Facilities. This Alkylation Improvement Project was a major modification at a major polluting facility. Therefore, the facility needed to comply with the following requirements.</p>

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(A) *Alternative Analysis. Submit an analysis of alternative sites, sizes, production processes, and environmental control techniques for the proposed source.*

In lieu of conducting an alternative analysis, Ultramar met the requirements of this subparagraph with compliance with the California Environmental Quality Act (CEQA) in accordance with Rule 1303(b)(5)(D). Since this proposed project has been analyzed by an environmental impact report, this subparagraph has been satisfied.

(B) *Statewide Compliance. Demonstrate that all major sources in the state under control of the applicant are in compliance or on a schedule for compliance with all applicable federal emissions standards.*

Ultramar has certified that all major sources in the state under control of the applicant are in compliance with all applicable federal emissions standards. Ultramar (Valero, Inc.) currently operates 7 major facilities in the state. The status of these facilities relative to Clean Air Act requirements is summarized in the following table:

**Table 5. Compliance Status of Valero Facilities Located in California**

<b>Valero California Facilities</b>	<b>Facility Location</b>	<b>Compliance Status</b>
Benicia Refinery	Benicia	Currently in compliance
Benicia Asphalt Plant	Benicia	Currently in compliance
Wilmington Refinery	Wilmington	Currently in compliance
Wilmington Asphalt Plant	Wilmington	Currently in compliance
Marine Terminal	Wilmington	Currently in compliance
Marine Tank Farm	Wilmington	Currently in compliance
Olympic Tank Farm	Wilmington	Currently in compliance

(C) *Protection of Visibility. Conduct a modeling analysis for plume visibility if the net emission increase from the new or modified source exceeds 15 tons/year of PM or 40 tons/year of NOx; and the location of the source is within specified distance from a Class I area.*

The emissions from the fuel gas treating Unit 88 are ROG emissions. In addition, the Ultramar refinery is not within the distance specified in Table C-1 of this rule of a Class I area. The refinery is more than 32 km from any Federal Class I Area. The nearest Federal Class I Area (San Gabriel Wilderness) is more than 65 km away, while the furthest Federal Class I Area (Joshua Tree Wilderness) is more than 170 km away. Therefore, a modeling analysis for plume visibility is not required for this

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	<p>project.</p> <p><i>(D) Compliance Through California Environmental Quality Act.</i></p> <p>The proposed project has been analyzed by an environmental impact report pursuant to Public Resources Code Section 21002.1 and Title 14 CCR Section 15080 subparagraph (b)(5)(A) and was deemed to be satisfied.</p> <p>Therefore, compliance of Rule 1303(b)(5) is expected.</p>	

<b>Rule 1401</b>	<b>New Source Review of Toxic Air Contaminants</b>	<b>March 7, 2008</b>																						
		<b>Application Deem Complete Date: 2008</b>																						
	<p>A health risk assessment (HRA) was performed for the Alkylation Improvement Project and included in Volume II of the Environmental Impact Report (EIR). The HRA was performed to determine if emissions of toxics air contaminants generated by the proposed project would exceed the District's thresholds of significance for cancer risk. Ultramar ran a Tier 4 modeling analysis using ISCST3 to determine maximum cancer risks. They also evaluated acute and chronic risks from emissions of toxic air contaminants using the ARB/ Office of Environmental Health Hazard Assessment (OEHHA) Health Risk Assessment Program.</p> <p>Based on air quality modeling and related assumptions, results show that the maximum incremental cancer risk (MICR) to the Maximum Exposed Individual Worker (MEIW) associated with the proposed project is <b>0.15 in a million</b> and to the Maximum Exposed Individual Resident (MEIR) was calculated to be <b>1.49 in a million</b>, which is below the Rule 1401 threshold limits of 1 in a million and 10 in a million. The calculated Acute Hazard Index (HIA) was <b>0.001</b>, less than the rule limit of 1.0. Additionally, the Chronic Hazard Index (HIC) was <b>0.0031</b>, also less than the rule limit of 1.0.</p> <p><b>Table 6. Health Risk Assessment Results for Alkylation Improvement Project</b></p> <table border="1"> <thead> <tr> <th rowspan="2"></th> <th colspan="2">Maximum Individual Cancer Risk (MICR)</th> <th rowspan="2">Chronic Hazard Index (HIC)</th> <th rowspan="2">Acute Hazard Index (HIA)</th> </tr> <tr> <th>MEIW</th> <th>MEIR</th> </tr> </thead> <tbody> <tr> <td>Project</td> <td>0.148 x 10<sup>-6</sup></td> <td>1.49 x 10<sup>-6</sup></td> <td>0.001</td> <td>0.0031</td> </tr> <tr> <td>Baseline</td> <td>1.03 x 10<sup>-6</sup></td> <td>2.49 x 10<sup>-6</sup></td> <td></td> <td></td> </tr> <tr> <td>Cumulative</td> <td>1.18 x 10<sup>-6</sup></td> <td>3.97 x 10<sup>-6</sup></td> <td></td> <td></td> </tr> </tbody> </table> <p>MEIR: Maximum Exposed Individual Resident MEIW: Maximum Exposed Individual Worker</p>			Maximum Individual Cancer Risk (MICR)		Chronic Hazard Index (HIC)	Acute Hazard Index (HIA)	MEIW	MEIR	Project	0.148 x 10 <sup>-6</sup>	1.49 x 10 <sup>-6</sup>	0.001	0.0031	Baseline	1.03 x 10 <sup>-6</sup>	2.49 x 10 <sup>-6</sup>			Cumulative	1.18 x 10 <sup>-6</sup>	3.97 x 10 <sup>-6</sup>		
	Maximum Individual Cancer Risk (MICR)			Chronic Hazard Index (HIC)	Acute Hazard Index (HIA)																			
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<b>Rule 1401</b>	<b>New Source Review of Toxic Air Contaminants</b>	<b>March 7, 2008</b>
		<b>Application Deem Complete Date: 2008</b>
	<p>At the time the HRA was performed, the emissions for the original proposed fuel gas treating unit (from A/N 416632) was estimated to be 7,716 lbs/year (21 lbs/day) using the emission factors outlined in BACT/LAER for Valves as VOC Fugitive Sources Memorandum signed by the District's Jay Chen, dated April 2, 1999. These emissions were used in the HRA. Since the current emissions (3,013.7 lbs/year, 8.37 lbs/day) are less than previously calculated emissions, the original HRA is still valid.</p>	

<b>Regulation XVII</b>	<b>Prevention of Significant Deterioration (PSD)</b>	<b>August 13, 1999</b>
	<p>On July 25, 2007, EPA redesignated the District the authority to implement the PSD program for issuing and modifying federal permits for new and modified major sources of attainment pollutants. This authority was previously rescinded on March 3, 2003.</p>	
1701(b)- Applicability	<p>This regulation applies to preconstruction review of stationary sources that emit attainment air contaminants. The South Coast Air Basin is in attainment for NO<sub>2</sub>, SO<sub>2</sub>, CO, and lead. Since Unit 88 only emits fugitive ROGs, it is not subject to PSD review.</p>	

<b>Rule 2005</b>	<b>New Source Review for RECLAIM</b>	<b>May 6, 2005</b>
		<b>Application Deem Complete Date: 2008</b>
	<p>Ultramar is a NO<sub>x</sub> and SO<sub>x</sub> RECLAIM facility. There is no emission increase of NO<sub>x</sub> or SO<sub>x</sub> from Fuel Gas Treating Unit 88.</p>	

<b>Regulation XXX</b>	<b>Title V</b>	<b>March 16, 2001</b>
	<p>Ultramar is a designated as a Title V facility. The Title V permit was issued on May 29, 2009. Therefore, the facility is now subject to the requirements of Reg XXX. Since there is an emission increase of 8.37 lbs/day of ROG and the equipment is subject to NSPS (40 CFR Part 60 Subpart GGG) and NESHAP (40CFR Part 63 Subpart CC), this application is subject to the requirements of a Significant Permit Revision [Rule 3000(b)(28)(I)].</p>	

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**PART 2 STATE REGULATIONS**

<b>California Environmental Quality Act (CEQA)</b>											
	<p>According to the District's CEQA guidelines, the thresholds for significant effect are:</p> <table border="1" style="width: 100%;"> <tr> <td>NOx</td> <td>55 pounds per day</td> </tr> <tr> <td>ROG</td> <td>55 pounds per day</td> </tr> <tr> <td>PM10</td> <td>150 pounds per day</td> </tr> <tr> <td>CO</td> <td>550 pounds per day</td> </tr> <tr> <td>SOx</td> <td>150 lbs per day</td> </tr> </table> <p>Based on the total emissions of the Alkylation Improvement Project, the proposed modification and new installations made this a significant project. Therefore, preparation of a CEQA document was required. The notice of preparation of draft Environmental Impact Report was issued on July 30, 2003. The draft Environmental Impact Report was issued on March 30, 2004. The public review period for this document was from April 1 through May 18, 2004. The Environmental Impact Report was certified on December 16, 2004. Because the ROG fugitive emissions from the current Unit 88 are less than that estimated from the original proposed Unit 88, the original CEQA document should still be valid.</p>	NOx	55 pounds per day	ROG	55 pounds per day	PM10	150 pounds per day	CO	550 pounds per day	SOx	150 lbs per day
NOx	55 pounds per day										
ROG	55 pounds per day										
PM10	150 pounds per day										
CO	550 pounds per day										
SOx	150 lbs per day										

**PART 3 FEDERAL REGULATIONS**

<b>40 CFR Part 60 Subpart GGG</b>	<b>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</b>
§60.590	Applicability and designation of affected facility. In accordance with §60.590(b), any affected facility (petroleum refinery) that commences construction or modification after January 4, 1983, and on or before November 7, 2006 is subject to the requirements of this subpart. The construction on Unit 88 began on June 2006 and is, therefore, subject to Subpart GGG.
§60.592	<p>Standards.</p> <p>(a) The facility complies with the requirements of §§60.482-1 to 60.482-10. §60.482-1 to 60.482-10 refers to Subpart VV – Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry and sets standards for the following:</p> <ul style="list-style-type: none"> <li>▪ §60.482-1 Standards: General</li> <li>▪ §60.482-2 Standards: Pumps in light liquid service.</li> <li>▪ §60.482-3 Standards: Compressors</li> </ul>

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<p><b>40 CFR Part 60 Subpart GGG</b></p>	<p><b>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</b></p>
	<ul style="list-style-type: none"> <li>▪ §60.482-4 Standards: Pressure relief devices in gas/vapor service</li> <li>▪ §60.482-5 Standards: Sampling connection systems.</li> <li>▪ §60.482-6 Standards: Open-ended valves or lines.</li> <li>▪ §60.482-7 Standards: Valves in gas/vapor service and in light liquid service.</li> <li>▪ §60.482-8 Standards: Pumps and valves in heavy liquid service, pressure relief devices in light liquid or heavy liquid service, and connectors.</li> <li>▪ §60.482-9 Standards: Delay of repair.</li> <li>▪ §60.482-10 Standards: Closed vent systems and control devices.</li> </ul> <p>All new fugitive components in VOC service meet and are expected to continue to meet the equipment standards and monitoring requirements in §§60.482-1 to 60.482.10. All new piping components associated with the equipment is monitored on a monthly and quarterly basis by refinery personnel.</p> <p>(b) The facility may elect to comply with the requirements of §§60.483-1 and 60.483-2.</p> <ul style="list-style-type: none"> <li>▪ §60.483-1 Alternative standards for valves--allowable percentage of valves leaking.</li> <li>▪ §60.483-2 Alternative standards for valves--skip period leak detection and repair.</li> </ul> <p>Ultramar has not elected to comply with the alternative standards for valves in §60.592(b).</p> <p>(c) The facility may apply to EPA for a determination of equivalency for any means of emission limitation that achieves a reduction in emissions of VOC at least equivalent to the reduction in emissions of VOC achieved by the controls required in this subpart.</p> <p>Ultramar has not applied for an equivalency determination for another means of emission limitation.</p> <p>(d) The facility complies with the provisions of §60.485 (Test methods and procedures) except as provided in §60.593 (Exemptions found in Subpart GGG). Ultramar shall conduct all monitoring using EPA Reference Method 21 as stated in §60.485(b)(1).</p> <p>(e) The facility is required to comply with the provisions of §60.486 (Recordkeeping requirements) and §60.487 (Reporting Requirements). The refinery will be required to submit semiannual reports to EPA beginning six months from initial startup with the information identified in §60.487(b) for the initial report and §60.487(c) for the subsequent semiannual reports.</p> <p>A system condition (S4.6) will be tagged to each applicable permit unit noting that all affected fugitive components are subject to 40CFR60, Subpart GGG.</p>

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<b>40CFR Part 63 Subpart CC</b>	<b>National Emission Standard for Hazardous Air Pollutants from Petroleum Refineries</b>
§63.648	This process unit is subject to the equipment leak standards, detection, and repair requirements of 40.CFR63 Subpart CC, Section 63.648. The equipment leak inspection and monitoring requirements of Rule 1173 are in general more stringent than that specified in Section 63.648. Therefore, compliance with the inspection, maintenance, and recordkeeping requirements of this rule are expected.

**CONCLUSION:**

Based on the above evaluation, a Permit to Operate/No Permit to Construct is recommended to be issued with the conditions listed in the Condition Section for the following applications:

Application #	Equipment Description
416632	Fuel Gas Treating Unit 88
502108	Facility Permit Revision

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**Appendix**

A.	Original Proposed Project Modifications (2004) and Original ReVAP Emission Increase Summary
B.	Unit 88 Process Flow Diagram
C.	Fugitive Emission Count
D.	Memorandum of Understanding, February 12, 2003

## Appendix A.

## Original Proposed Project Modifications (2004)

Item	A/N	Unit	Capacity		Purpose
			Pre-Modification	Post-Modification	
1.	416622*	Alkylation Unit 68	14,500 bpd	20,000 bpd	<ul style="list-style-type: none"> <li>• Install ReVAP;</li> <li>• Enhance alkylate production capacity</li> </ul>
2.	416626*	Butamer Unit 69	10,000 bpd	17,000 bpd	Increase capacity to provide sufficient isobutane feed to enhance the alkylation unit with the ReVAP.
3.	416625*	LPG Merox Treating Unit 64	6,500 bpd	10,000 bpd	Increase capacity to provide additional desulfurized butane feed to the Butamer unit
4.	416627*	Light Ends Recovery Unit 43	1,000 bpd	5,000 bpd	Increase butane recovery for Butamer unit feed
5.	416624*	Naphtha Hydrotreater Unit 56	29,000 bpd	29,000 bpd	Enhance unit to separate the butane and light straight runs (hydrocarbons)
6.	416633	Butane Storage Tank Unit 82	0	5,000 bbls	Provide additional butane storage with the increased flow of normal butane feed to the Butamer unit Facility total throughput increase: 1.2 mmbbl/year <ul style="list-style-type: none"> <li>• Pre-modification: 2.3 mmbbl/year</li> <li>• Post-modification: 3.5 mmbbl/year</li> </ul>
7.	416636	Propane Storage Tank Unit 81 <sup>+</sup>	0	4,000 bbls	Provide additional propane storage with the increased production of propane product due the increased alkylation capacity Facility total throughput increase: 0.2 mmbbl/year <ul style="list-style-type: none"> <li>• Pre-modification: 0.9 mmbbl/year</li> <li>• Post-modification: 1.1 mmbbl/year</li> </ul>
8.	421771*	Vapor Recovery Unit 93	123.8 mscfh	124.5 mscfh	Recover light hydrocarbons discharged into the plant flare header
9.	416628	Boiler Unit 86	0	245 mmBtu/hr	Provide steam (200,000 lbs per hour) for modified alkylation unit, Butamer unit, and new flare
10.	416629	SCR Unit 86	n/a	n/a	Control NOx from new boiler
11.	416634 <sup>+</sup>	Hot Oil Heater Unit 68	0	350 mmBtu/hr	Provide heat source to reboil the iso stripper tower in the alkylation unit and the fractionation column in the Butamer unit.
12.	416635 <sup>+</sup>	SCR Unit 68	n/a	n/a	Control NOx from new heater

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Item	A/N	Unit	Capacity		Purpose
			Pre-Modification	Post-Modification	
13.	416630	Ammonia Storage Tank Unit 86 <sup>+</sup>	0	15,000 gal	Store ammonia for two new SCRs Units 86 and 68
14.	419147 <sup>++</sup>	Heater Unit 56	200 mmBtu/hr	260 mmBtu/hr	Provide additional process heat to a circulating stream of desulfurized gas oil in the Naphtha Hydrotreater unit
15.	421772 <sup>++</sup>	SCR Serving Unit 56	n/a	n/a	Control NOx from modified heater Unit 56
16.	416632 <sup>#</sup>	Fuel Gas Treating Unit 88	0	18 mmdcfd	Reduce the sulfur content (hydrogen sulfide, carbonyl sulfide, and mercaptans) of the refinery fuel gas to be consumed by the combustion equipments, such as the new and modified units (boiler, 86-B-9003; hot oil heater, 68-H-2; hot oil heater, 56-H-2)
17.	416631 <sup>+</sup>	Flare Unit 75	0	250 lbs/hr	Provide additional relief capacity (250 lbs per hour) for all the units affected by the alkylation improvement project
18.	n/a	Cooling Tower	0	5,000 gpm	Provide additional cooling water for modified Alkylation and Butamer Units
19.	n/a <sup>*</sup>	Cooling Tower Unit 90-CY-9002	8,000 gpm	13,000 gpm	Provide additional cooling water for modified Alkylation and Butamer Units
20.	n/a	Storage tank relocation	n/a	n/a	Three storage tanks located immediately north of the Alkylation unit and Butamer unit to accommodate the improvements to the Alkylation unit.

- \* Modification of existing units
- + Not constructed or modified
- # A different unit constructed

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**Original ReVAP Emission Increase Summary**

A/N	Equipment Description	Unit #	Controlled Emission Increase											
			VOC		NO <sub>x</sub>		SO <sub>x</sub>		PM <sub>10</sub>		CO		NH <sub>3</sub>	
			lbs/day	lbs/yr	lbs/day	lbs/yr	lbs/day	lbs/yr	lbs/day	lbs/yr	lbs/day	lbs/yr	lbs/day	lbs/yr
416622	Alkylation Unit	68	76.8	27,630										
416624	Naphtha Hydrotreater	56	8.4	3,026										
416625	LPG Mercox	64	0	0										
416626	Butamer	69	6.5	2,343										
416627	Light Ends Recovery	43	7.9	2,847										
416628	Boiler, Unit 86	86	33.3	11,977	70.56	25,754	70.98	25,908	88.2	31,752	235.2	84,672		
416629	SCR (for Boiler, 86-B-9003)	86											53.04	19,094
416630	Storage Tank, Ammonia TK 86-TK-1	86											negligible	negligible
416631	Flare	75	8	2740	0.75	271	0	2	0.04	16	0.2	73		
416632	Fuel Gas Treating Unit	88	21.4	7,716										
416633	Storage Tank, Butane, pressurized	81	4.9	1,747										
416634	Heater, Hot Oil, Unit 68-H-2	68	50.3	18,094	55.44	20,236	101.4	37,011	126	45,360	168	60,480		
416635	SCR (for Heater, 68-H-2)	68											34.02	12,247
416636	Storage Tank, Propane, pressurized	82	3.2	1,164										
419147	Heater, Hot Oil, Unit 56-H-2	56	7.2	2,592	0	0	17.38	6,307	21.6	8,136	29.03	10,451		
421772	SCR (for Heater, 56-H-2)	56											5.83	2,099
421771	Vapor Recovery Unit	93												
<b>Total Projected Emission Increase</b>			<b>227.9</b>	<b>81,876</b>	<b>126.75</b>	<b>46,261</b>	<b>189.76</b>	<b>69,228</b>	<b>235.84</b>	<b>85,264</b>	<b>432.43</b>	<b>155,676</b>	<b>92.89</b>	<b>33,440</b>

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	<b>PROCESSED BY:</b> Connie Yee	<b>CHECKED BY:</b>

**Appendix B.**

**Unit 88 Process Flow Diagram**



<b>SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT</b> <i>ENGINEERING &amp; COMPLIANCE</i> <b>APPLICATION PROCESSING AND CALCULATIONS</b>	<b>PAGES</b> 29+	<b>PAGE</b> 26
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### Appendix C.

#### Fugitive Component Count

- **Current Fuel Gas Treating Unit 88 (A/N 465660)**
- **Original Proposed Fuel Gas Treating Unit 88 (A/N 416632)**

Process Unit:

Current Fuel Gas Treating Unit 88 (A/N 465660)

Source Unit	Service	No. Of Existing Components (1)	No. of Existing Components to be Removed (2)	No. of New Components to be Installed (3)	1999 AQMD Factor		Correlation Equation (CE) Factor (500 ppm)		
					Emission Factor AQMD Practice 500 ppm Monthly I&M (lbs/year)	Emissions based on 500 ppm Monthly I&M (lbs/year)	Correlation Equation Factor 500 ppm Screening Value (lbs/year)	Emissions based on 500 ppm Correlation Equation Factor (lbs/year)	
Valves	Sealed Bellows	All	0	0	6	0	0	0.00	0
	SCAQMD Approved I&M Program	Gas / Vapor	0	0	67	23	1,541	4.55	304.85
		Light Liquid (4)	0	0	0	19	-	4.55	-
		Heavy Liquid (5)	0	0	0	3	-	4.55	-
	> 8 inches				19	-		-	
Pumps	Sealless Type	Light Liquid (4)	0	0	0	0	-		-
	Double Mechanical Seals or Equivalent Seals	Light Liquid (4)	0	0	0	104	-	46.83	-
	Single Mechanical Seals	Heavy Liquid (5)	0	0	0	80	-	46.83	-
Compressors	Gas / Vapor	0	0	0	0	514	-	9.09	-
Flanges (ANSI 16.5-1988)	All	0	0	0	0	2	-	6.99	-
Connectors	All	0	0	0	0	2	-	2.86	-
Pressure Relief Valves	All	0	0	3	0	0	0	0	0
Process Drains with P-Trap or Seal Pot	All	0	0	5	0	80	400	9.09	45.45
Other (including fittings, hatches, sight-glasses, and meters)	All	0	0	293	0	2	586	9.09	2,663.37
Total Emissions	lb/year						2,527		3,013.7
	lbs/day						7.02		8.37

-1 Any component currently installed prior to the modification.

-2 Any component to be removed due to modification.

-3 Any new component proposed to be installed due to the modification; this also includes new components to be installed to replace existing components.

-4 Light liquid and gas/liquid streams: Liquid or gas/liquid stream with a vapor pressure greater than that of kerosene (>0.1 psia @ 100°F or 689 Pa @ 38°C), based on the most volatile class present at 20% by volume. - used single mechanical seal EF

-5 Heavy Liquid: streams with a vapor pressure equal to or less than that of kerosene (< 0.1 psia @ 100°F or 689 Pa @ 38°C), based on the most volatile class present at 20% by volume.

-6 Emission Factors were developed using actual emissions for 10 quarters from Q3, 2005 through Q4, 2007 for Cleans Fuel Area and using a factor of 2 to the actual emissions.

Process Unit:

Original Proposed Fuel Gas Treating Unit 88 (A/N 416632)

Source Unit		Service	No. Of Existing Components (1)	No. of Existing Components to be Removed (2)	No. of New Components to be Installed (3)	1999 AQMD Factor		Correlation Equation (CE) Factor (500 ppm)	
						Emission Factor AQMD Practice 500 ppm Monthly I&M (lbs/year)	Emissions based on 500 ppm Monthly I&M (lbs/year)	Correlation Equation Factor 500 ppm Screening Value (lbs/year)	Emissions based on 500 ppm Correlation Equation Factor (lbs/year)
Valves	Sealed Bellows	All	0	0	259	0	0	0.00	0
	SCAQMD Approved I&M Program	Gas / Vapor	0	0	108	23	2,484	4.55	490.94
		Light Liquid (4)	0	0	2	19	38	4.55	9.09
		Heavy Liquid (5)	0	0	96	3	288	4.55	436.39
		> 8 inches	0	0	158	19	3,002	4.55	718.23
Pumps	Sealless Type	Light Liquid (4)	0	0	0	0	-	-	-
	Double Mechanical Seals or Equivalent Seals	Light Liquid (4)	0	0	0	104	-	46.83	-
		Heavy Liquid (5)	0	0	0	80	-	46.83	-
Compressors	Gas / Vapor	0	0	0	514	-	9.09	-	
Flanges (ANSI 16.5-1988)	All	0	0	576	2	864	6.99	4,026.35	
Connectors	All	0	0	0	2	-	2.86	-	
Pressure Relief Valves	All	0	0	12	0	-	0	0	
Process Drains with P-Trap or Seal Pot	All	0	0	13	80	1,040	9.09	118.17	
Other (including fittings, hatches, sight-glasses, and meters)	All	0	0	0	2	-	9.09	0	
Total Emissions	lb/year						7,716		5,799.17
	lbs/day						21		16.11

-1 Any component currently installed prior to the modification.

-2 Any component to be removed due to modification.

-3 Any new component proposed to be installed due to the modification; this also includes new components to be installed to replace existing components.

-4 Light liquid and gas/liquid streams: Liquid or gas/liquid stream with a vapor pressure greater than that of kerosene (>0.1 psia @ 100°F or 689 Pa @ 38°C), based on the most volatile class present at 20% by volume. - used single mechanical seal EF

-5 Heavy Liquid: streams with a vapor pressure equal to or less than that of kerosene (< 0.1 psia @ 100°F or 689 Pa @ 38°C), based on the most volatile class present at 20% by volume.

-6 Emission Factors were developed using actual emissions for 10 quarters from Q3, 2005 through Q4, 2007 for Cleans Fuel Area and using a factor of 2 to the actual emissions.

<b>SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT</b> <i>ENGINEERING &amp; COMPLIANCE</i> <b>APPLICATION PROCESSING AND CALCULATIONS</b>	<b>PAGES</b> 29+	<b>PAGE</b> 29
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	<b>PROCESSED BY:</b> Connie Yee	<b>CHECKED BY:</b>

**Appendix D.**

**Memorandum of Understanding, February 12, 2003**

## MEMORANDUM OF UNDERSTANDING

### BETWEEN THE SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT AND ULTRAMAR INC.-VALERO'S WILMINGTON REFINERY

### REGARDING TERMINATION OF STORAGE AND USE OF CONCENTRATED HYDROGEN FLUORIDE AT THE WILMINGTON REFINERY

#### Parties:

This Memorandum of Understanding ("MOU") is entered on February 12, 2003 (the "Effective Date") between the South Coast Air Quality Management District ("District"), with its headquarters at 21865 E. Copley Drive, Diamond Bar, California, and the Valero Wilmington Refinery ("Refinery"), owned by Ultramar Inc., a subsidiary of Valero Energy Corporation, and located at 2402 East Anaheim Street, Wilmington, California.

#### A. Background:

- The District is the regional air pollution control agency with jurisdiction over the area in which the Refinery is located.
- On March 25, 1999, the Governor signed Executive Order D-5-99, directing that methyl tertiary butyl ether (MTBE) be discontinued as an oxygenate in California gasoline, and requiring that the objectives of California's Phase 3 Reformulated Fuels requirements still be obtained.
- The Refinery operates an alkylation unit for the purpose of producing alkylate, an important component of California reformulated gasoline. Currently, the unit uses concentrated hydrogen fluoride (HF) as a catalyst in this process.
- The District has proposed requiring the use of a modified HF process with a volatility suppressant or an alternative process that eliminates the use of concentrated HF. HF has the potential to be a toxic air contaminant and the District desires to significantly reduce the potential risks associated with accidental releases of this chemical.
- In response to the District's proposal, the Refinery conducted a preliminary evaluation of the feasibility of using a modified alkylation process, and on November 1, 2002, reported to the District that it is prepared to install the Reduced Volatility Alkylation Process ("ReVAP") which suppresses the volatility of HF. This process uses modified HF instead of concentrated HF in the alkylation process.
- The use of modified HF meets the District's objective.

- Refinery also plans to upgrade the alkylation process to improve process vessels' compatibility with the ReVAP process. The ReVAP process will be designed to have sufficient capacity to accommodate additional throughput resulting from improved process efficiency. Refinery believes this action will help offset gasoline volume losses that may occur as a result of implementing the CARB Phase III reformulated gasoline and Governor's Order to phase out MTBE.

**B. Purpose:**

In consideration of the above, the purpose of this MOU is to establish an enforceable agreement that eliminates the use of concentrated HF at the Refinery and commits both parties to a specific timeline that allows for modification of the alkylation unit to incorporate the use of ReVAP technology as set forth herein.

**C. General Agreement for Alkylation Unit Modification:**

1. Recognizing the need for coordination of unit construction, retrofits and start-up with other Refinery operational activities Refinery will commit the personnel and financing necessary to complete engineering, permitting and construction for the ReVAP process and associated modification to the alkylation process necessary to integrate the operation of the ReVAP technology in accordance with the following schedule:
  - [a] Begin engineering design of the ReVAP process and associated modification to the alkylation process necessary for the integration of the ReVAP process within two months of the Effective Date.
  - [b] Submit information necessary for the preparation of the California Environmental Quality Act (CEQA) documents for this project within four months of the Effective Date.
  - [c] Submit complete District applications for permits to construct the ReVAP process and associated modification to the alkylation process necessary for integration of the ReVAP process within four months of the Effective Date. During the permit preparation phase, the Refinery will provide the District with monthly progress updates and the expected dates of permit submission.
  - [d] Begin construction of the ReVAP process units and modification of alkylation process necessary for integration of the ReVAP process no later than seven months after all permits required for construction are issued.
  - [e] Complete construction and commence operation of the modified alkylation process inclusive of ReVAP by December 31, 2005 unless otherwise provided for in Paragraph C.7.

2. The Refinery will replace the transportation, storage and use of concentrated HF in the alkylation process with modified HF concurrent with the commencement of the operation of the ReVAP process, which shall be December 31, 2005 unless otherwise provided for in Paragraph C.7.
3. Modified HF shall contain a minimum of 6% suppressants for transportation and storage.
4. The District will undertake permit review in compliance with applicable laws including, but not limited to, the California Environmental Quality Act (CEQA) and Permits to Construct.
5. Until the ReVAP Project is permitted, the Refinery shall continue to inform the District of the progress and results of its evaluation of alternative alkylation technologies. If at any point the Parties mutually agree that an alternative technology is commercially demonstrated and technically and economically feasible, they will reassess the commitments and process in this MOU for purposes of adopting the alternative technology.
6. The District will respond promptly to permit applications, supplemental information submittals, and CEQA submittals. The Refinery will likewise respond promptly to requests for information and changes to permit documentation. The parties will work together and with other agencies to provide all necessary information necessary for permit review and public involvement.
7. → The parties agree that the target date for issuing all permits will be March 1, 2004. This date shall be extended for an unforeseen delay beyond the reasonable control of Refinery that may occur in the permitting phase, including but not limited to CEQA review, U.S. EPA review, third party litigation regarding the permitting and Coastal Development Permitting. The permitting would be extended only by the number of days caused by the unforeseen delay. The number of days the permit is extended, for whatever reason, shall be the same number of days the commencement of operation of the ReVAP unit shall be extended. This extension shall apply to Paragraphs C.1.e. and C.2.
8. The District recognizes that the construction and operation of the ReVAP process units, and the modifications to the alkylation process both to integrate the ReVAP process and to increase the feed throughput in the alkylation unit to make up for the gasoline volume loss due to implementation of Phase III reformulated gasoline and the Governor's order to phase out MTBE, are activities to be "installed and modified solely to comply with District, state, or federal air pollution control laws, rules, regulations or orders, as approved by the Executive Officer or designee." The District also recognizes if the proposed modifications result in no increase in maximum crude throughput rate at the Valero Wilmington Refinery, then the installation and operation of the ReVAP

process, the modification to the alkylation process to integrate the ReVAP process, modification to the alkylation process to improve process efficiency resulting in the increase of alkylation feed throughput to make up the gasoline volume loss to comply with CARB Phase III reformulated gasoline and the Governor's order to phase out MTBE, are exempt from offsets pursuant to Rule 1304(c)(4).

**D. Liquidated Damages:**

The parties agree that any determination of damages resulting from a breach of this MOU would be speculative and uncertain. The parties, accordingly, agree to the payment of liquidated damages for breach of this MOU, as expressly specified in this Section.

1. Refinery commits to installing and operating in the manner described herein, ReVAP or another District-approved HF suppressant process in the alkylation unit. In the event the Refinery decides to abandon an HF suppressant project and continues the use of concentrated HF on or after January 1, 2006, based on reasons other than for reasons allowed under Sections E.2., E.5. or C.1.e., C.2. or C.7. Refinery shall pay liquidated damages to the District in the amount of \$1,000,000. In the event the Refinery pays the above referenced liquidated damages, no further liquidated damages shall be due.
2. Refinery commits to eliminate the use of concentrated HF by the date specified in Section C.2. If Refinery does not eliminate the use of concentrated HF by this date other than for reasons allowed under Sections E.2., E.5., C.1.e., C.2. or C.7. and provided Refinery has not otherwise paid liquidated damages as provided in D.1 above, and the District has reasonably determined Refinery has not made a good faith effort to expeditiously eliminate the use of concentrated HF, District may assess Refinery up to \$5,000 in liquidated damages for each day past the date specified in Section C.2. However, the District shall not commence assessment under this paragraph until the eleventh day following the date specified in Paragraph C.2.
3. Refinery commits to filing permits and commencing construction on the times specified in the MOU. If Refinery does not file permits and commence construction by the dates designated other than for reasons allowed under Sections E.2., E.5., C.1.e., C.2. or C.7. and provided Refinery has not otherwise paid liquidated damages as provided in Section D.1. above and the District reasonably determines Refinery has not made a good faith effort to meet its scheduled deadlines, and Refinery does not meet one or both of these commitments on or before the dates specified, District may assess Refinery up to \$5,000 for each day past five business days that the Refinery does not meet its commitment.

4. Notwithstanding the provisions in Paragraphs D.2. and D.3. above, the District may not assess Refinery more than an aggregate annual total of \$1,000,000 in liquidated damages in any single calendar year.

**E. General Conditions:**

1. Term. The term of the MOU shall commence on the Effective Date and shall continue until terminated.
2. Termination.
  - (a) The District may terminate this MOU by providing written notice to the Refinery in the event that:
    - I. The District determines that the Refinery has materially breached its obligations set forth in this MOU.
    - II. In accordance with Section E.5., the Refinery is excused from compliance with the commitments of the MOU due to one or more events of force majeure continuing for 12 months through the term of the MOU.
    - III. The Refinery continues to use or resumes the use of concentrated HF more than 120 days beyond the date specified in Section C.2. or C.7.
  - [b] The Refinery may terminate this agreement by providing written notice to the District in the event that:
    - I. The materials necessary to complete construction of this project are not available, and will not be available through all reasonable efforts of the Refinery, and the District will not agree to a commensurate extension of time to complete the work necessary to fulfill the MOU.
    - II. On or before construction of the ReVAP is completed, the District, CARB, EPA or a court of proper jurisdiction has taken final action that restricts the use of HF by the Refinery or restricts the construction of the alkylation unit contemplated herein, provided this action is inconsistent with the terms of this MOU.
  - [c] The parties may mutually agree to terminate this MOU at any time.
  - [d] Termination of this MOU shall be effective from seven (7) calendar days of receipt of a written notice of termination by either party.
3. Effect of this MOU. The actions proposed under this MOU satisfy the objectives of the District with respect to the use of HF catalyst at the

Refinery, and once the Refinery has commenced modification of the alkylation unit as committed herein, and continues the modification process in good faith and in a timely manner, the District will take no further action to regulate the use of HF. However, should a subsequent event reveal that further measures are necessary to adequately protect the public health and safety, the District may, after consultation with the Refinery, adopt further regulations that are necessary to protect the public health and safety and are economically feasible for the Refinery to undertake giving full considerations to the past investments already made on the alkylation unit.

4. Other Facilities. The District acknowledges that there are significant costs involved in the Refinery's commitment to alternative alkylation technology, and that if any other refinery within the District's jurisdiction is allowed to use conventional HF alkylation it would have an adverse competitive effect on the Refinery. The District staff shall commence rulemaking and exercise all reasonable efforts to restrict the use of concentrated HF by any similarly situated user of HF alkylation.
5. Force majeure. A party shall not be held responsible for delays or failure to meet its commitments under this MOU where such delay or failure is based upon circumstances that are beyond the reasonable control of the party claiming force majeure, and the events or circumstances affect the nonperforming party's ability to comply with the terms hereof.

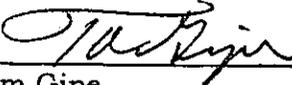
Events of force majeure include strikes, work stoppages, natural or man made disaster, changes in state or federal government laws or regulations, any action of a governmental entity, including permit denials, conditions or modifications or other causes that frustrate the intent of this MOU.

Upon becoming aware that an occurrence constitutes an event of force majeure, the Refinery shall promptly notify the District and both parties must use their best efforts to remove the force majeure event and resume performance as quickly as possible, and may suspend performance only for such period of time and to the extent necessary as a result of the event or circumstance that constitutes force majeure.

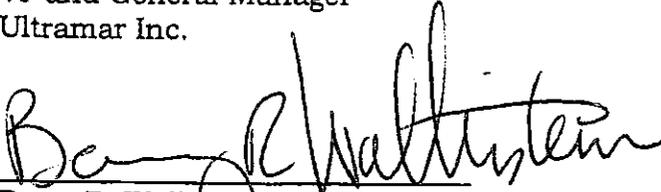
SIGNATORIES

TO THE MEMORANDUM OF UNDERSTANDING BETWEEN THE SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT AND ULTRAMAR INC.-VALERO'S WILMINGTON REFINERY REGARDING TERMINATION OF STORAGE AND USE OF CONCENTRATED HYDROGEN FLUORIDE AT THE WILMINGTON REFINERY

Signed and Entered as of the Effective Date:

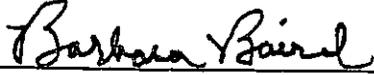
  
\_\_\_\_\_  
Tom Gipe  
VP and General Manager  
Ultramar Inc.

2/12/03  
Date

  
\_\_\_\_\_  
Barry R. Wallerstein, D.Env.  
Executive Officer  
South Coast Air Quality Management  
District

2/12/03  
Date

APPROVED AS TO FORM:

  
\_\_\_\_\_  
Barbara Baird, District Counsel

2/12/03  
Date