SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT	PAGES 14	PAGE 1
ENGINEERING & COMPLIANCE DIVISION	APPL. NO. 492721	DATE 8/4/09
APPLICATION PROCESSING AND CALCULATIONS	PROCESSED BY Jon Uhl	CHECKED BY

PERMIT TO CONSTRUCT EVALUATION

COMPANY NAME, LOCATION ADDRESS:
Ultramar Inc, SCAQMD ID # 800026
2402 E. Anaheim Street
Wilmington, CA 90744

CONFIDENTIAL BUSINESS INFORMATION

Information designated as confidential business information by Ultramar Inc. is found in Attachment A.

EQUIPMENT DESCRIPTION:

Section H of the Ultramar Title V Facility Permit, ID# 800026

Note: this is a permit to construct for new equipment

Equipment	ID No.	Connected To	Source Type/ Monitoring Unit	Emissions And Requirements	Conditions
Process 3 : CATALYTIC CRACKING					P13.1
System 7 : FCCU FRESH CATALYST AND CATALYST ADDITIVE LOADER					
VESSEL, FRESH CATALYST AND CATALYST ADDITIVE INJECTION SYSTEM, GRACE-DAVISON MULTI-LOADER, MODEL MLS-2452-AWC, HEIGHT: 6 FT 7 IN; WIDTH: 3 FT; LENGTH: 3 FT, WITH A/N: 492721 Permit to Construct: TBD TWO FILTERS, CARTRIDGE TYPE, WITH PULSE JET CLEANING, FLEETLIFE, MODEL FA376094 OR EQUIVALENT, HEIGHT: 2 FT 6 IN, DIAMETER: 13.875 IN, INNER DIAMETER: 9.5 IN	Dnew			PM: (9) [RULE 404, 2-7-1986; RULE 405, 2-7-1986]	B27.x C6.x D12.x D322.x D381.1 K67.x

CONDITIONS:

The following permit conditions shall apply to the loader in order to comply with all applicable District, State, and Federal standards. Additions and deletions to the conditions are noted in underlines and strikeouts, respectively.

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: 1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 14]

DEVICE CONDITIONS

B. Material/Fuel Type Limits

B27.x The operator shall not use in this equipment any materials containing any toxic air contaminants (TACs) identified in the SCAQMD Rule 1401, as amended 03/07/2008.

The operator shall maintain records in a manner approved by the District, to demonstrate compliance with this condition.

[RULE 1401, 3-7-2008]

[Devices subject to this condition: Dnew]

C. Throughput or Operating Parameter Limits

C6.x The operator shall operate this equipment in such a manner that the differential pressure across the filter does not exceed 8 inches of water column.

[RULE 1303(b)(2)-Offset, 5-10-1996; RULE 1303(b)(2)-Offset, 12-6-2002; **RULE 3004(a)(4)-Periodic Monitoring, 12-12-1997; RULE 401, 3-2-1984**; RULE 401, 11-9-2001]

[Devices subject to this condition: Dnew]

D. Monitoring/Testing Requirements

D12.x The operator shall install and maintain a(n) differential pressure gauge to accurately indicate the differential pressure across the filter.

The operator shall record and keep records of the differential pressure readings once per week.

[RULE 1303(a)(1)-BACT, 5-10-1996; RULE 1303(a)(1)-BACT, 12-6-2002; **RULE 1303(b)(2)-Offset, 5-10-1996**; RULE 1303(b)(2)-Offset, 12-6-2002; **RULE 3004(a)(4)-Periodic Monitoring, 12-12-1997; RULE 401, 3-2-1984**; RULE 401, 11-9-2001; **RULE 404, 2-7-1986; RULE 405, 2-7-1986**]

[Devices subject to this condition: Dnew]

D322.x The operator shall perform annual inspection of the equipment and filter media for leaks, broken or torn filter media, and improperly installed filter media.

The operator shall maintain records in a manner approved by the District, to demonstrate compliance with this condition.

[RULE 3004(a)(4)-Periodic Monitoring, 12-12-1997; RULE 401, 3-2-1984; RULE 401, 11-9-2001; **RULE 404, 2-7-1986; RULE 405, 2-7-1986]**

[Devices subject to this condition: Dnew]

D381.1 The operator shall conduct an inspection for visible emissions from all stacks and other emission points of this equipment whenever there is a public complaint of visible emissions, whenever visible emissions are observed, and on an annual basis, at least, unless the equipment did not operate during the entire annual period. The routine annual inspection shall be conducted while the equipment is in operation and during daylight hours. If any visible emissions (not including condensed water vapor) are detected, the operator shall take corrective action(s) that eliminates the visible emissions within 24 hours and report the visible emissions as a potential deviation in accordance with the reporting requirements in Section K of this permit.

The operator shall keep the records in accordance with the recordkeeping requirements in Section K of this permit and the following records:

1). Stack or emission point identification;

2). Description of any corrective actions taken to abate visible emissions; and

3). Date and time visible emission was abated.

[RULE 3004(a)(4)-Periodic Monitoring, 12-12-1997; RULE 401, 3-2-1984; RULE 401, 11-9-2001]

[Devices subject to this condition: D946, D1566, D1568, Dnew]

K. Recordkeeping/Reporting

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

The name of the person performing the inspection and/or maintenance of the filter media

The date, time, and results of the filter media inspection

The date, time, and description of any maintenance or repairs resulting from the filter media inspection

[RULE 3004(a)(4)-Periodic Monitoring, 12-12-1997; RULE 401, 3-2-1984; RULE 401, 11-9-2001; **RULE 404, 2-7-1986; RULE 405, 2-7-1986]**

[Devices subject to this condition: Dnew]

REVIEW OF COMPLIANCE DATABASE:

As of August 4, 2009, a check of the AQMD Compliance Database shows that this facility has received eighteen (18) Notices of Violation (NOVs) since January 1, 2007. None of the NOVs applied to the existing catalyst additive loaders. There are no outstanding NOVs at this time.

BACKGROUND:

Ultramar operates this refinery in the city of Wilmington. The facility is a NOx and SOx RECLAIM facility. The Title V permit was issued effective 5/29/2009.

Ultramar currently operates two identical Catalyst Additive Loaders attached to the Fluidized Catalytic Cracking Unit (FCCU); see A/N's 432021 & 432476. Ultramar is applying for a permit to construct a third fresh catalyst and catalyst additive loader for the FCCU. This loader serves a similar function, but is supplied by a different manufacturer and has a different method of operation.

This application was received 12/10/2008 and deemed complete 1/14/2009.

Table 1-AQMD Submitted Applications

A/N	Date Submitted	Equipment	Device ID	Requested Action
492721	Dec 10, 2008	FCCU Fresh Catalyst and Catalyst Additive Loader	Dnew	• New construction
493982	Jan 14, 2009	De minimis significant Facility Permit revision – RECLAIM/Title V	n/a	• Facility Permit Revision

FEE EVALUTION:

The fees paid for the applications are:

Table 2 – Application Fees Paid

A/N	Equipment	BCAT	Type	Status	Fee Schedule	Fees Required, $	Fees Paid, $
492721	FCCU Fresh Catalyst and Catalyst Additive Loader	110920	10	20	C	3,244.91	3,244.91
	Expedited Processing Fee					1,622.46	1,622.46
493982	Facility Permit Revision – RECLAIM	555009	86	21		843.80	843.80
	De minimis Facility Permit Revision – Title V					843.83	0.00
Total						6,555.00	5,711.17

Ultramar submitted these applications before their Title V permit was effective; therefore, the RECLAIM-only fees have been paid. An additional fee of $843.83 will be billed to Ultramar for the Title V facility permit amendment; Rule 301(k)(5) & (l)(7).

PROCESS DESCRIPTION:

FCCU Operation

The FCCU utilizes a solid-phase catalyst to convert heavy feedstock into lighter components. As the reactions proceed, impurities and carbon deposits build up on the catalyst, reducing the catalyst effectiveness. The spent catalyst is sent to a regenerator, where heated air is used to burn off the impurities and carbon deposits to restore the catalyst activity. Regenerated catalyst is returned to the FCCU; fresh catalyst is added to makeup any losses. The loader evaluated here injects fresh catalyst and catalyst additives, supplied as dry powders, into the new catalyst feed stream.

The regeneration process creates CO, NOx, SOx and PM emissions from combustion. The exhaust is sent through an electrostatic precipitator to reduce the PM before discharge to the atmosphere. Reduced sulfur also leaves the FCCU via H_2S in the sour water and H_2S in the FCCU overhead off-gas.

Fresh Catalyst and Catalyst Additives

Fresh catalyst is used to makeup any losses from FCC catalyst regeneration. Fresh FCC catalyst is supplied as a fine powder and stored in the fresh catalyst storage hopper [Process 3, System 4, Device D40]. Currently, fresh FCC catalyst is injected from the storage hopper into the fresh catalyst feed line at a set frequency and duration (controlled by a timer). Plant air is used to pressurize the hopper and induce catalyst flow. The rate of fresh catalyst addition is not accurately controlled by this method. Connecting the fresh catalyst storage hopper to the loader and using the loader to inject fresh catalyst will improve the metering of the fresh catalyst. This new method of injecting fresh catalyst will not change the operation of the FCCU.

Appendix A contains information on the catalyst additives. The catalyst additives are supplied as a fine powder in sealed one-ton totes. The totes are connected to the loader via a 2" hose.

The only direct emissions from the loader are PM10 emissions from handling the powdered materials. Ultramar has stated that there are no Rule 1401 TAC's in the catalyst additives (see email dated 4/2/2009) and the fresh catalyst (see the Grace Davison MSDS dated 3/17/2004). Condition B27.x excludes any materials containing Rule 1401 TAC's and requires records to demonstrate compliance.

Loader Operation

This loader will be used to transfer fresh catalyst from the fresh catalyst storage hopper [device D40], and catalyst additive powder from bulk totes, into the fresh catalyst feed line.

First, the powder is "vacuumed" into the loader vessel using an air-powered vacuum eductor to pull a vacuum on the loader vessel. Approximately 0 to 300 lbs of powdered material are moved from the storage hopper or bulk totes in to the loader vessel in approximately 10 minutes. PM10 emissions from the eductor exhaust are controlled with a cartridge filter. The filter housing is built into the loader vessel.

Second, the powder is injected into the fresh catalyst feed line. Compressed air is applied to the loader vessel to move the powder from the vessel into the feed line. There are no PM emissions during the injection part of the cycle.

The entire loader cycle is automatically controlled to achieve a specific powder injection rate. The maximum rate of powder injection is 48,000 lb/day.

Filter Monitoring and Inspection

Condition D381.1 requires inspection for visible emissions whenever there is a public complaint, whenever visible emissions are observed, and an annual inspection. Corrective action is required within 24 hours. Condition D322.2 requires an annual inspection of the filter media. Condition D12.x requires installation of a differential pressure gauge across the filter to monitor filter performance. Since the loader cycle is short (10

minutes), the differential pressure is recorded once per week.

Filter Replacement Criterion

The filter manufacturer recommends replacement when the differential pressure across the filter exceeds 8 to 9" w.c. Condition C6.x limits the differential pressure across the filter to 8" w.c.

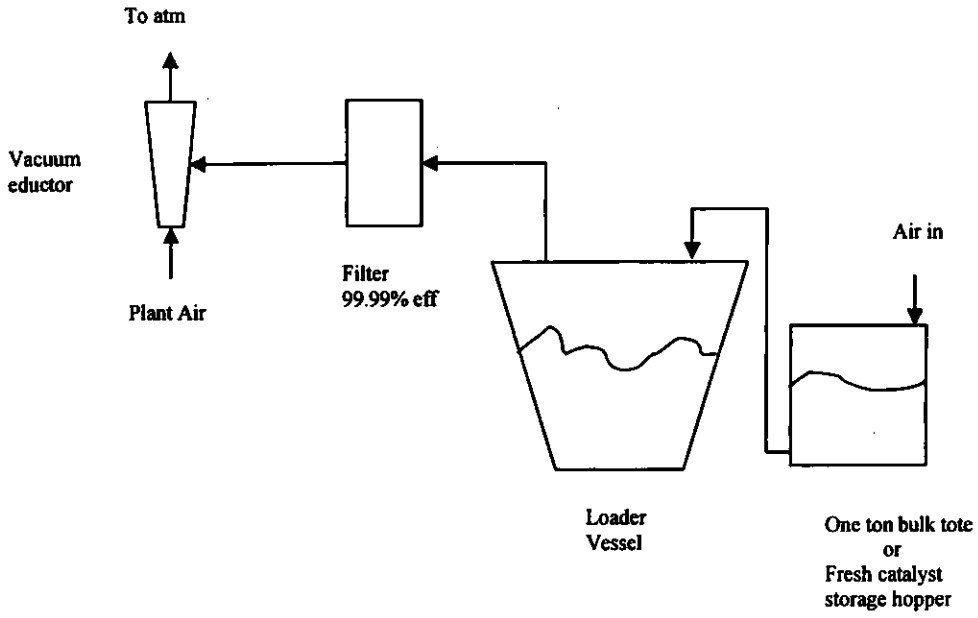


Figure 1 – Vacuum cycle, transfers powder from bulk totes or storage hopper to the loader vessel

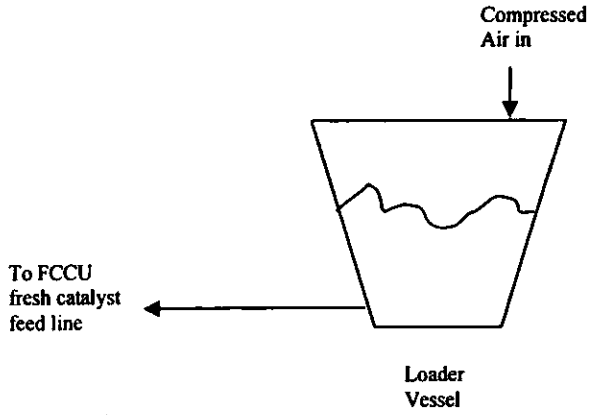


Figure 2 – Pressure cycle, transfers powder from loader vessel to FCCU

EMISSIONS:

The only direct emissions from loader operation are PM10 emissions from transferring the powdered materials from the bulk totes or storage hopper to the loader vessel. PM10 emissions are controlled with a cartridge filter. Calculation of the uncontrolled and controlled PM10 potential to emit (PTE) and the Rule 404 calculation are contained in Attachment A.

Table 3: Summary of Emissions and Required Offsets

A/N	Emission	Uncontrolled emissions		Controlled emissions		Offsets Required (lb/day)
		lb/hr	lb/day	lb/hr	lb/day	
492721	PM10	20.	480.	0.0020	0.048	0.

RULES EVALUATION:

PART 1 SCAQMD REGULATIONS

Rule 212	**Standards for Approving Permits**	**November 14, 1997**
	The loader meets all criteria in Rule 212 for permit approval. The equipment is designed so it can be expected to operate without emitting air contaminants in violation of Division 26 of the State Health and Safety Code or in violation of AQMD's rules and regulations. The construction of a loader does not constitute a significant project because (1) the permit unit is not located within 1000 feet of a school; (2) the emissions increase does not exceed the daily maximum specified in subdivision (g) of this rule (30 lbs/day); and (3) the permit unit does not have an increased cancer risk greater than, or equal to, one in a million ($1x\ 10^{-6}$) during a lifetime of 70 years or pose a risk of nuisance.	

Rule 401	**Visible Emissions**	**November 9, 2001**
	With properly maintained filters, visible emissions are not expected in normal operation. Compliance is expected.	

Rule 402	**Nuisance**	**May 7, 1976**
	With properly maintained filters, nuisance complaints are not expected. Compliance is expected.	

Rule 404	**Particulate Matter - Concentration**	**February 7, 1986**
	The total air flow rate during transfer operations is 182 cfm. PM discharge concentration is 0.0013 grains/ft^3. Rule limit is 0.196 grains/ft^3. Compliance is expected.	

Rule 405	**Solid Particulate Matter - Weight**	**February 7, 1986**
	During transfer operations the PM emission rate is 0.0020 lb/hr. The rule limit for a 2,000 lb/hr process throughput is 3.92 lb/hr. Compliance is expected.	

Rule 1105	Fluid Catalytic Cracking Units – Oxides of Sulfur	September 1, 1984
	There are no additional requirements under Rule 1105 for the installation and operation of this loader.	

Rule 1105.1	Reduction of PM10 and Ammonia Emissions from Fluid Catalytic Cracking Units	November 7, 2003
	There are no additional requirements under Rule 1105.1 for the installation and operation of this loader.	

REG XIII	New Source Review (NSR)	December 6, 2002 Application Deem Complete Year: 2009
1303(a): BACT	The increase in PM10 emissions is less than one pound per day. BACT not required.	
1303(b)(1): Modeling	The increase in PM10 emissions is less than the 0.41 lb/hr allowable PM10 emissions for noncombustion sources given in Appendix A, Table A-1. Modeling not required.	
1303(b)(2): Offsets	The increase in PM10 emissions is less than 0.50 lb/day; offsets are not required	
1303(b)(3)	No offsets required; sensitive zone requirements do not apply.	
1303(b)(4)	The facility complies with all applicable rules and regulations of the District. There are no outstanding NOVs as of 8/4/2009.	
1303(b)(5)	This is an existing major polluting facility, but this is not a major modification to the facility.	

Rule 1401	New Source Review of Toxic Air Contaminants	March 7, 2008 Application Deem Complete Year: 2009
	There are no TAC emissions from the loader; therefore, no increase in MICR, cancer burden, chronic HI or Acute HI. Permit condition B27.x excludes use of any materials containing TAC's identified in SCAQMD Rule 1401, as amended 3/7/2008; and requires records to demonstrate compliance.	

REG XVII	Prevention of Significant Deterioration	August 13, 1999
	The loader is not a source of NOx, SO_2 or CO emissions.	

REG XX	RECLAIM	May 11, 2001
	The loader is not a source of NOx or SOx emissions. No additional RECLAIM requirements.	

REG XXX	Title V	March 16, 2001

Ultramar was issued a Title V permit effective on May 29, 2009. This is a **de minimis significant permit revision** as defined in Rule 3000(b)(6), where the cumulative emission increases of non-RECLAIM pollutants or hazardous air pollutants (HAP) from all de minimis significant permit revisions during the term of the Title V permit are not greater than the threshold levels given in this rule.

Air Contaminant	Prior revisions	This revision	Total	Threshold level
HAP	0.	0.	0.	30. lb/day
VOC	0.	0.	0.	30. lb/day
PM10	0.	0.048	0.048	30. lb/day
CO	0.	0.	0.	220. lb/day

Rule 3000 (b)(12)(A)(i)	This revision does not require or change a case-by-case evaluation of: reasonably available control technology (RACT) pursuant to Title I of the federal Clean Air Act; or maximum achievable control technology (MACT) pursuant to 40 CFR Part 63, Subpart B.
(b)(12)(A)(ii)	This revision does not violate a regulatory requirement.
(b)(12)(A)(iii)	This revision does not require any significant change in monitoring terms or conditions in the permit.
(b)(12)(A)(iv)	This revision does not require relaxation of any recordkeeping, or reporting requirement, or term, or condition in the permit.
(b)(12)(A)(vii)	This revision does not establish or change a permit condition that the facility has assumed to avoid an applicable requirement.
(b)(12)(A)(viii)	This revision is not an installation of a new permit unit subject to a New Source Performance Standard (NSPS) pursuant to 40 CFR Part 60, or a National Emission Standard for Hazardous Air Pollutants (NESHAP) pursuant to 40 CFR Part 61 or 40 CFR Part 63.
(b)(12)(A)(ix)	This revision is not a modification or reconstruction of an existing permit unit, resulting in new or additional NSPS requirements pursuant to 40 CFR Part 60, or new or additional NESHAP requirements pursuant to 40 CFR Part 61 or 40 CFR Part 63.

A de minimis significant permit revision is subject to a **45-day EPA review**, Rule 3003(j) and not subject to public participation requirements, Rule 3006(b).

PART 2 STATE REGULATIONS

California Environmental Quality Act (CEQA)
The applicant has submitted Form 400-CEQA. This is not a significant project.

PART 3 FEDERAL REGULATIONS

There are no Federal Regulations directly applicable to the loader. The following NSPS and NESHAP regulate FCCUs:

- **40 CFR 60 Subpart J – Standards of Performance for Petroleum Refineries**
  The FCCU is currently subject to Subpart J. The installation and operation of the loader will not affect compliance with NSPS Subpart J
- **40 CFR 60 Subpart Ja – Standards of Performance for Petroleum Refineries for Which Construction, Reconstruction, or Modification Commenced After May 14, 2007**
  Per §60.101a, the fluid catalytic cracking unit (FCCU) includes the riser, reactor, regenerator, air blowers, spent catalyst or contact material stripper, catalyst or contact material recovery equipment, and regenerator equipment for controlling air pollutant emissions and for heat recovery. Installation of the loader does not construct, modify, or reconstruct the FCCU; therefore, the requirements of NSPS Subpart Ja do not apply.
- **40 CFR 63 Subpart UUU – National Emission Standards for Hazardous Air Pollutants for Petroleum Refineries: Catalytic Cracking Units, Catalytic Reforming Units, and Sulfur Recovery Units**
  The FCCU is currently subject to Subpart UUU. The installation and operation of the loader will not affect compliance with NESHAP Subpart UUU.

RECOMMENDATION

A/N	Recommendation
492721	Issue Permit to Construct with conditions listed in the Conditions Section
493982	De minimis significant revision to Title V Facility Permit, Section H

List of Attachments

A. Confidential Business Information: Catalyst Additives
Calculation of the Potential to Emit
Alternate filter efficiency calculation

Attachment A: Confidential Business Information

All information contained in Attachment A has been designated Confidential Business Information by Ultramar Inc.

Catalyst Additives

Ultramar utilizes several SOx reduction and octane-enhancing catalyst additives. The SOx reduction additive is intended to reduce the SOx emissions from the regenerator and increase the H_2S in the sour water and FCCU off-gas. The H_2S is removed from the sour water by the sour water strippers and sulfur recovery units (SRU). The FCCU off-gas goes to the fuel gas treater for H_2S removal via amine contactors. The SOx reduction additive should reduce overall SOx emissions. The effect on emissions due to the octane-enhancing additives is not known.

Calculation of Potential to Emit (PTE)

Maximum process rate = 48,000 lb/day = 2,000 lb/hr

Typical Particle Size Distribution

(Grace Davison GSR-5, provided by Grace Davison; see email dated 4/2/2009 from Wesley Waida)

Particle size	Weight %
0 – 20 µm	1 %
21 – 40 µm	8 %
41 – 80 µm	42 %
81 – 105 µm	20 %
106 – 149 µm	24 %
150+ µm	4 %

The worst case scenario is all the 0 – 20 µm material is PM10 and can be emitted through the vacuum eductor if there is no filter. The maximum uncontrolled PM10 PTE is:

Uncontrolled, R1 = (2,000 lb/hr)*(1%) = 20. lb/hr PM10

Cartridge Filter Efficiency

(see letter dated 7/13/2009 from Grace Davison/Clemtex)

Particle size	Filter efficiency
0 – 20 µm	99.99 %
20+ µm	100 %

(see below for an alternative estimate of the filter efficiency)

The maximum controlled PM10 PTE is:

Controlled, R2 = (20. lb/hr)*(1-.9999) = 0.0020 lb/hr PM10

Rule 404 Calculation

Air flow rate during transfer = 182 cfm

PM concentration = (0.0020 lb/hr)*(7000 grain/lb)*(1 hr / 60 min) * (1 min / 182 ft^3) = 0.0013 grains/ft^3

Alternate Filter Efficiency Calculation

Additive Particle Size Distribution

(Grace Davison GSR-5, provided by Grace Davison; see email dated 4/2/2009 from Wesley Waida)

Particle size	Weight %	Cumulative Weight%
0 – 20 µm	1 %	1 %
21 – 40 µm	8 %	9 %
41 – 80 µm	42 %	51 %
81 – 105 µm	20 %	71 %
106 – 149 µm	24 %	95 %
150+ µm	4 %	

Maximum process rate = 48,000 lb/day = 2,000 lb/hr

The log-normal distribution is often used to approximate the particle size distribution of pulverized materials.

Log-Normal Distribution

Fitting the particle size distribution data to a log-normal curve (Figure 1A) gives:

Mass median diameter, d_{50} = 77µm
Variance, σ = 0.648

The Weight% smaller than diameter, d_p is:

$$Weight\% = 100\% \bullet \frac{1}{2}\left[1 - erf\left(\frac{\ln(d_{50}) - \ln(d_p)}{\sigma \bullet \sqrt{2}}\right)\right]$$

Particle size, d_p	Weight % smaller than d_p	Weight% * 48,000 lb/day
20 µm	1.88 %	902.40 lb/day
10 µm	0.082 %	39.36 lb/day
5 µm	0.0012 %	0.576 lb/day
3 µm	0.000028 %	0.013 lb/day
2 µm	8.8×10^{-7} %	0.0004 lb/day

Cartridge Filter Efficiency

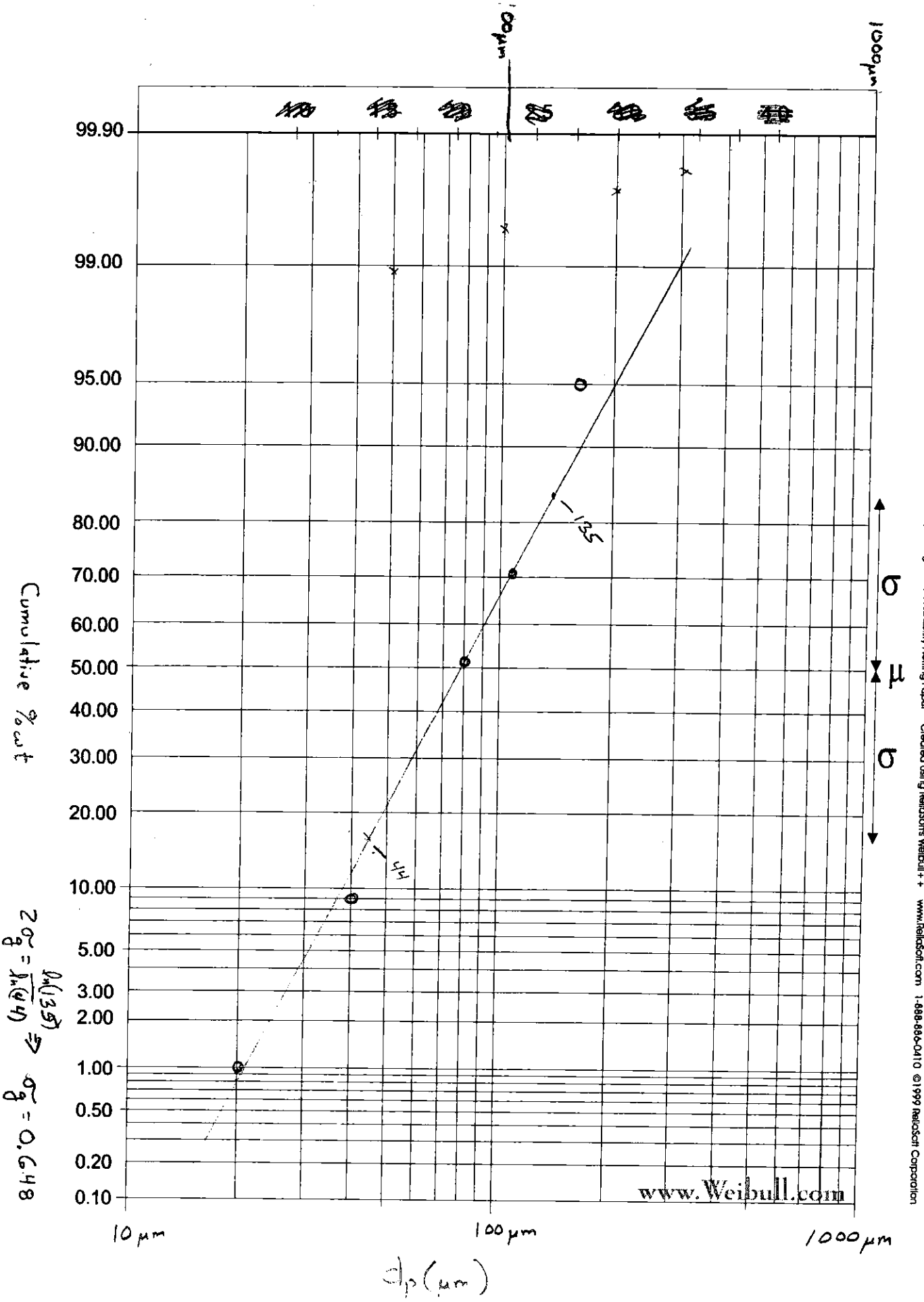
(see letter dated 7/13/2009 from Grace Davison/Clemtex)

Particle size	Filter efficiency
10.0 µm	100.0 %
5.0 µm	100.0 %
3.0 µm	99.5 %
2.0 µm	99.4 %
1.0 µm	99.2 %
0.5 µm	98.9 %

Uncontrolled, R1 = (48,000 lb/hr)*(0.082%)
= 39.36 lb/day PM10
Controlled, R2 = (39.36 – 0.576 lb/day)*(1-1.00)
+ (0.576 – 0.013) * (1- 0.995)
+ (0.013) * (1 – 0.996)
= 0.003 lb/day PM10

Overall filter efficiency for PM10 = (0.003) / (39.36) = 99.993 %

ATTACHMENT A - CONFIDENTIAL BUSINESS INFO.



$\sigma_g = 0.648 \Leftarrow \frac{\ln(84.1)}{\ln(50)} = \frac{\sigma_g}{2.0}$

$\mu_{50} = 47\mu m$

FIGURE 1A : LOG-NORMAL DISTRIBUTION

END of P/C Evaluation

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	APPL. NO. 494177	DATE July 24, 2009
	PROCESSED BY: Connie Yee	CHECKED BY:

PERMIT TO CONSTRUCT

COMPANY NAME, LOCATION ADDRESS
Ultramar Inc. Facility ID. 800026
2402 E. Anaheim Street
Wilmington CA 90744-4081

EQUIPMENT DESCRIPTION

Section H of the Ultramar's Facility Permit:

Additions or changes to equipment description, emissions, and conditions are underlined. Deletions to equipment description and conditions are shown with strikeouts.

Equipment	ID No.	Connected To	RECLAIM Source Type/ Monitoring Unit	Emissions and Requirements	Conditions
Process 3: CATALYTIC CRACKING					P13.1
System 1: FCCU					S13.2, S15.5, S15.12, S42.1
REACTOR, FCC, 61-R-1R, WITH CYCLONE, HEIGHT: 153 FT 10 IN; DIAMETER: 15 FT 6 IN A/N: ~~462069~~ 494177	D35				
REGENERATOR, FCC, 61-IN-1, WITH CYCLONE, HEIGHT: 100 FT 6 IN; DIAMETER: 26 FT 6 IN WITH A/N: ~~462069~~ 494177	D36	C39	NOX: MAJOR SOURCE SOX: MAJOR SOURCE	[CO]: 500 PPMV (8) 40CFR 60 Subpart J,10-4-1991, CONSENT DECREE, 6-16-2005 [CO]: 2000 PPMV (5) RULE 407,4-2-1982 [HAP]: (10) 40CFR 63 Subpart UUU, #2,4-11-2002 ~~[NOX]: 125 LBS/HR (7) RULE 2005, 5-6-2006~~ [NOX]: 80 PPMV (8) CONSENT DECREE, 6-16-2005 [PM]: 2 LBS/TON COKE BURN (8) 40CFR 60 Subpart J, 10-4-1991,	A63.4, A63.8, ~~A99.1~~, ~~A99.2~~, A195.2, A195.4, B61.4, D29.2, ~~D29.7~~, D29.12, D29.13, D82.3, D90.4, D323.1, D425.1, D425.2, ~~E193.3~~, E73.5, E193.4, H23.27, ~~K40.2~~, K40.3

Equipment	ID No.	Connected To	RECLAIM Source Type/ Monitoring Unit	Emissions and Requirements	Conditions
~~INJECTOR, STANDBY OXYGEN INJECTION~~	~~B1476~~			CONSENT DECREE, 6-16-2005 [PM]: (9) RULE 404,2-7-1986;RULE 405,2-7-1986 [PM10]: 2.8 LBS/1000 BBL FRESH FEED (5), RULE 1105.1, 11-07-2003 ~~[SOX]: 94.38 LBS/HR (7) RULE 2005, 5-6-2006~~	
TANK, SURGE, 61-V-3, RAW OIL, HEIGHT: 35 FT; DIAMETER: 12 FT 6 IN A/N: ~~462069~~ 494177	D37				
BLOWER, 61-BL-1, MAIN AIR, 80,142 CFM, SINGLE STAGE CENTRIFUGAL WITH A 8,000 HP MOTOR (REPLACES 6,000 HP MOTOR) A/N: ~~462069~~ 494177	D1023				
VESSEL, SEPARATOR, 61-CY-3, THIRD STAGE A/N: ~~462069~~ 494177	D1024				
TANK, SURGE, 61-V-10, FLUE GAS COOLER, HEIGHT: 20 FT; DIAMETER: 6 FT A/N: ~~462069~~ 494177	D1247				
EJECTOR, 61-BLX-1-EJ-1 A/N: ~~462069~~ 494177	D1249				
FUGITIVE EMISSIONS, MISCELLANOUS A/N: ~~462069~~ 494177	D1321			[HAP]: (10) 40CFR 63 Subpart CC, #5A,5-25-2001	

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

[40CFR61, SUBPART FF]

SYSTEM CONDITIONS:

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, 12/07/90]

S15.5 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 vapor recovery system(s).

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

[RULE 1303(a)(1)-BACT, 05/10/96; RULE 1303(b)(2)-Offset, 05/10/96]

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, 05/10/96; RULE 1303(b)(2)-Offset, 05/10/96]

S42.1 The operator shall not operate the FCCU unless, by December 31, 2008, the operator complies with the requirements of the following rule:

CONTAMINANT	RULE	RULE NUMBER/SUBPART
PM10	DISTRICT RULE	1105.1
AMMONIA (NH3)	DISTRICT RULE	1105.1

If the operator fails to comply with any of the terms and conditions listed below, the operator shall be subject to the compliance deadlines as specified in Rule 1105.1(d)(1).

a. Award all contracts to design the control technology selected for compliance with Rule 1105.1(d)(1) by September 15, 2006. Award all contracts to construct and install the control technology by July 1, 2007.

b. Submit information necessary for the preparation of the California Environmental Quality Act (CEQA) documents for equipment installation and modification for Rule 1105.1(d)(1) compliance, by August 15, 2006.

c. Submit complete applications for permits to construct the control technology selected for compliance with emission limits specified in Rule 1105.1(d)(1) by October 1, 2006. Upon receiving a letter from the AQMD deeming the applications completed by October 1, 2006, Ultramar will be considered in compliance with this requirement.

d. Begin construction of the control technology permitted by AQMD for compliance with Rule 1105.1(d)(1) by October 1, 2007, or within 30 days of receiving all necessary permits, whichever is later.

e. Complete demolition, site preparation and excavation no later than November 2, 2007.

f. Have available on-site, all components needed for the complete assembly of the technology selected, which is electrostatic precipitation, by June 1, 2008.

g. Start operation of the control equipment permitted to ensure compliance with Rule 1105.1(d)(1) by December 1, 2008.

h. Comply with Rule 1105.1(d)(1) no later than December 31, 2008.

[RULE 1105.1]

Note: Although all the deadlines listed above in Condition S42.1 have passed and been fulfilled, the District's Source Testing division has not completed their review of the PM10 source tests conducted on December 30-31, 2008. Therefore, Condition S42.1 will remain until Source Testing has completed their review and deemed the test report acceptable.

DEVICE CONDITIONS:

A. Emission Limits

A63.4 The operator shall limit emissions from this equipment as follows:

CONTAMINANT	EMISSIONS LIMIT		
CO	Less than or equal to	955	LBS PER DAY
PM	Less than or equal to	562	LBS PER DAY

RULE 1303(b)(2)-Offset, 5-10-1996

Note: See Appendix A for emissions.

A63.8 The operator shall limit emissions from this equipment as follows:

CONTAMINANT	EMISSIONS LIMIT		
Visible emissions	Less than or equal to	30	Percent opacity

40CFR 60 Subpart J, 10-4-1991

~~A99.1 The 125 Lbs/hr NOX emission limit(s) shall only apply when the regenerator is using the oxygen injection system. This condition ensures that no increase in emissions occurs and that BACT is not triggered. Readings from the CEMS shall be used to demonstrate compliance.~~

~~RULE 2005, 4-20-2001~~

~~A99.2 The 94.38 Lbs/hr SOX emission limit(s) shall only apply when the regenerator is using the oxygen injection system. This condition ensures that no increase in emissions occurs and that BACT is not triggered. Readings from the CEMS shall be used to demonstrate compliance.~~

~~RULE 2005, 4-20-2001~~

Note: Conditions A99.1 and A99.2 were included in the PC issued on November 21, 2003 to A/N 418083 in which Ultramar proposed to add an oxygen injection system to the regenerator. The NSR NOx and SOx limits were added to the Facility Permit in the form of Conditions A99.1 and A99.2 since there was concern that the use of the oxygen injection system would increase the NOx and SOx emissions. To date, this oxygen injection system has been not constructed. Ultramar has requested that A/N 418083 be cancelled. However, since A/N 418083 is one of three previous applications to the current A/N 494177, A/N 418083 will remain active, but Conditions A99.1 and A99.2 will be removed since they are no longer applicable.

A195.2 The 500 ppmv CO emission limit(s) is averaged over a one-hour block and at 0% oxygen on a dry basis.

CONSENT DECREE, 6-16-2005

A195.4 The 80 ppmv NOx emission limit is averaged over 365-day rolling and at 0% oxygen.

CONSENT DECREE, 6-16-2005

B. Material/Fuel Type Limits

B61.4 The operator shall not use fresh feed containing the following specified compounds:

Compound	Weight Percent
Total sulfur greater than	0.3

40CFR 60 Subpart J, 10-4-1991

D. Monitoring/Testing Requirements

D29.2 The operator shall conduct source test(s) for the pollutant(s) identified below.

Pollutant(s) to be tested	Required Test Method(s)	Averaging Time	Test Location
PM emissions	Approved District method	District-approved averaging time	Outlet

The test(s) shall be conducted at least annually.

The test shall be conducted when the equipment is operating under normal conditions.

Source test results shall be submitted to the District no later than 60 days after the source test was conducted

RULE 1303(b)(2)-Offset, 5-10-1996

~~D29.7 The operator shall conduct source test(s) for the pollutant(s) identified below.~~

~~Pollutant(s) to be tested~~	~~Required Test Method(s)~~	~~Averaging Time~~	~~Test Location~~
~~VOC~~	~~Approved District method~~	~~District-approved averaging time~~	~~Stack~~
~~PM emissions~~	~~Approved District method~~	~~District-approved averaging time~~	~~Stack~~

~~The test(s) shall be conducted only when FCCU feed rate is at least 80% of maximum during normal operation and actual FCCU feed rate during oxygen injection.~~

~~The three total tests shall occur as follows.~~

~~a) One test shall occur during normal operation before oxygen injection is used. This test shall occur no later than 180 days after installation of the oxygen injection system, and~~

~~b) One test shall occur during oxygen injection, and~~

~~c) One test shall occur during normal operation after the oxygen injection system event has occurred. This test shall occur no later than 60 days after returning the regenerator to normal operations.~~

~~The test shall also be conducted to determine oxygen levels in the exhaust. During the test, the operator shall measure and record FCCU feed rate, catalyst recirculation rate, coke burn-off rate, flue gas flow rate, flue gas moisture content, the flue gas temperature at the outlet of the ESP, regenerator combustion temperature, FCCU feed pre-heat temperature, opacity readings from the opacity meter, blower airflow rate and the average current, voltage, and spark rate at each ESP fields.~~

~~The operator shall monitor and record NOx, SOx and CO emission taken from CEMS. Also, the operator shall monitor and record the oxygen injection rate during oxygen injection.~~

~~The test shall be conducted in accordance with a District approved source test protocol. The protocol shall be submitted to the District engineer no later than 45 days before the proposed test date and shall be approved by the District before the test commences. The test protocol shall included the proposed operating conditions, the identity of the testing lab, a statement from the testing lab certifying that it meets the criteria of Rule 304 and a description of all sampling and analytical procedures.~~

~~RULE 1303(b)(2) Offset, 5-10-1996; RULE 1303(b)(2) Offset, 12-6-2002; RULE 2005, 4-20-2001; RULE 401, 3-2-1984; RULE 401, 11-9-2001; RULE 404, 2-7-1986; RULE 405, 2-7-1986~~

Note: Condition D29.7 is being removed since it was included in A/N 418083 when Ultramar proposed to add an oxygen injection system to the regenerator. The PC was issued on November 21, 2003. To date, this oxygen injection system has been not constructed. Ultramar has requested that A/N 418083 be cancelled and, therefore, this source testing condition should be removed. A/N 418083 will remain active since A/N 418083 is one of three previous applications to the current A/N 494177.

D29.12 The operator shall conduct source test(s) for the pollutant(s) identified below.

Pollutant(s) to be tested	Required Test Method(s)	Averaging Time	Test Location
PM emissions	Approved District method	District-approved averaging time	Outlet

The test(s) shall be conducted at least annually.

The test shall be conducted when the equipment is operating under normal conditions.

Source test results shall be submitted to the District no later than 60 days after the source test was conducted

Source test results shall include the following parameters: FCCU feed rate; catalyst recirculation rate; coke burn rate; oxygen content of exhaust gases; exhaust flow rate; exhaust gas moisture content; the flue gas temperature at the outlet of the ESP; and the average current, voltage, and spark rate at each ESP fields

RULE 3004(a)(4)-Periodic Monitoring, 12-12-1997

D29.13 The operator shall conduct source test(s) for the pollutant(s) identified below.

Pollutant(s) to be tested	Required Test Method(s)	Averaging Time	Test Location
PM10 emissions	District Method 5.2 Modified with EPA Method 201A Cyclone (filterables compliance, condensables information)	District-approved averaging time	Stack outlet of ESPs
PM10 emissions	District Method 5.2 (filterables compliance, condensables information)	District-approved averaging time	Stack outlet of ESPs
PM10 emissions	District Method 5.2 with Previously Determined PM10 to PM Ratio Applied (filterables compliance, condensables information)	District-approved averaging time	Stack outlet of ESPs
PM10 emissions	EPA Method 5 (filterables compliance) and EPA Method 202 (condensables information)	District-approved averaging time	Stack outlet of ESPs
NH3 emissions	District Method 207.1	1-hour	Stack outlet of ESPs
CO emissions	District Method 100.1 or 10.1	1-hour	Stack outlet of ESPs

The operator shall choose any of the PM10 test methods as indicated above to comply with Rule 1105.1 requirements.

For the purposes of this condition, filterable PM10 is PM10 collected on the cyclone exit, probe, and filter(s) of the applicable test methods referenced above. Condensable PM10 is the PM10 collected in the impingers of the applicable test methods referenced above.

The test shall be conducted after the AQMD approval of the source test protocol, but no later than 180 days after initial startup of the new ESP. The AQMD engineer shall be notified in writing of the date and time of the test at least 10 days prior to the test.

The test shall be conducted at a minimum with the following modes of operation:

1. ESPs 61-PR-1A and 61-PR-1B in full operation with 4 T/Rs operating and ESP 61-PR-2 with 2 T/Rs operating.

2. ESP 61-PR-2 with 6 T/Rs operating and ESPs 61-PR-1A and 61-PR-1B in idle mode.

3. ESPs 61-PR-1A and 61-PR-1B in operation with 2 T/Rs operating [i.e. one T/R each] and ESP 61-PR-2 with 4 T/Rs operating.

Ultramar may propose additional modes of ESP operation to be tested in the test protocol.

The test shall be conduced when the FCCU is operating with at least 80 percent of the total feed rate.

The tests shall be conducted at least every year with the above three operating modes after the initial source test.

Source test results shall include the following parameters: FCCU feed rate in BPD; catalyst recirculation rate and make-up rate in BPD; catalyst inventory in the equipment; fresh catalyst feed; sulfur content (%) in the feed ,coke burn-off rate; oxygen content of exhaust gases; exhaust flow rate; exhaust gas moisture content; the flue gas temperature at the outlet of the ESP; ammonia injection rate prior to the ESP (if applicable) and the average current in amps, voltage in volts, and spark rate at each ESP in use.

RULE 1105.1, 11-7-2003, RULE 404, RULE 405, RULE 407, RULE 1303(b)(2)-Offset, 5-10-1996

D82.3 The operator shall install and maintain a CEMS to measure the following parameters:

CO concentration in ppmv

Oxygen concentration in percent volume

RULE 1303(b)(2)-Offset, 5-10-1996

D90.4 The operator shall monitor the opacity at the stack according to the following specifications:

The operator shall maintain and operate the opacity meter and record the readings as required pursuant to 40CFR60, Subpart J at all times except during periods of required maintenance and malfunction of the opacity meter.

40CFR 60 Subpart J, 10-4-1991

D323.1 The operator shall conduct an inspection for visible emissions from all stacks and other emission points of this equipment whenever there is a public complaint of visible emissions, whenever visible emissions are observed, and on an annual basis, at least, unless the equipment did not operate during the entire annual period. The routine annual inspection shall be conducted while the equipment is in operation and during daylight hours.

If any visible emissions (not including condensed water vapor) are detected that last more than three minutes in any one hour, the operator shall verify and certify within 24 hours that the equipment causing the emission and any associated air pollution control equipment are operating normally according to their design and standard procedures and under the same conditions under which compliance was achieved in the past, and either:

1). Take corrective action(s) that eliminates the visible emissions within 24 hours and report the visible emissions as a potential deviation in accordance with the reporting requirements in section k of this permit; or

2). Have a CARB-certified smoke reader determine compliance with the opacity standard, using EPA Method 9 or the procedures in the CARB manual "Visible Emission Evaluation", within three business days and report any deviations to AQMD.

The operator shall keep the records in accordance with the recordkeeping requirements in Section K of this permit and the following records:

1). Stack or emission point identification;

2). Description of any corrective actions taken to abate visible emissions;

3). Date and time visible emission was abated; and

4). All visible emission observation records by operator or a certified smoke reader.

[RULE 3004(a)(4)-Periodic Monitoring, RULE 401]

D425.1 The operator shall have the existing NOx CEMS monitoring this device recertified within 90 days of the start-up of the modification of this device. If the CEMS is not recertified within 90 days of start-up of this device, the facility permit holder shall calculate and report NOx emissions in accordance with Rule 2012, Appendix A, Chapter 2, Paragraph (B)(16) - Recertification Requirements.

[RULE 2012]

D425.2 The operator shall have the existing SOx CEMS monitoring this device recertified within 90 days of the start-up of the modification of this device. If the CEMS is not recertified within 90 days of start-up of this device, the facility permit holder shall calculate and report SOx emissions in accordance with Rule 2011, Appendix A, Chapter 2, Paragraph (B)(17) - Recertification Requirements.

[RULE 2011]

Note: The NOx and SOx CEMS have found to meet the requirements of RECLAIM and 40CFR60 Subpart J but have not been granted final certification yet. Therefore, the conditions D425.1 and D425.2 will remain.

E. Equipment Operation/Construction Requirements

E73.5 Notwithstanding the requirements of Section E conditions, the operator may, at his discretion, choose not to use ammonia injection if:

The FCCU meets the Rule 1105.1 filterable PM10 emission limit of 2.8 pounds per thousand barrels of fresh feed.

[RULE 1105.1]

~~E193.3 The operator shall operate and maintain this equipment according to the following requirements:~~

~~The operator shall only use the oxygen injection system when the Power recovery turbine (D1249) is down due to a Rule 430 breakdown.~~

~~RULE 1303(b)(2) Offset, 5-10-1996; RULE 1303(b)(2) Offset, 12-6-2002~~

Note: Condition E193.3 is being removed since it was included in A/N 418083 when Ultramar proposed to add an oxygen injection system to the regenerator. The PC was issued on November 21, 2003. To date, this oxygen injection system has been not constructed. Ultramar has requested that A/N 418083 be cancelled and, therefore, this condition should be removed.

E193.4 The operator shall operate and maintain this equipment as follows:

The operator shall not operate any mode specified in Condition D29.13 if the source test results show that operating mode exceeds PM (2.8 lbs per 1,000 bbl fresh feed) and NH3 (10 ppmv) limits as specified in Rule 1105.1.

Notwithstanding the requirements of Section E conditions, the operator is not required to operate all three ESPs (61-PR-1A, 61-PR-1B, 61-PR-2) in full operation when venting the FCCU Regenerator catalyst fine exhaust if:

The operator shall maintain in operation a minimum of 6 of 12 transformer/rectifier sets.

[Rule 1105.1]

H. Applicable Rules

H23.27 This equipment is subject to the applicable requirements of the following rules or regulations:

Contaminant	Rule	Rule/Subpart
PM10	District Rule	1105.1
HAPs	40CFR63, SUBPART	UUU
CO	40CFR60, SUBPART	J
PM	40CFR60, SUBPART	J
Opacity	40CFR60, SUBPART	J
SOx	40CFR60, SUBPART	J

RULE 1105.1; 40CFR63, Subpart UUU; 40CFR 60, Subpart J

K. Recordkeeping/Reporting

~~K40.2 The operator shall provide to the District a source test report in accordance with the following specifications:~~

~~Source test results shall be submitted to the District no later than 60 days after the source test was conducted.~~

~~All exhaust flow rate shall be expressed in terms of dry standard cubic feet per minute (DSCFM) and dry actual cubic feet per minute (DACFM).~~

~~Emission data shall be expressed in terms of mass rate (lbs/hr). In addition, solid PM emissions, if required to be tested, shall also be reported in terms of grains per DSCF.~~

~~Emission data shall also be expressed in terms of concentration (ppmv).~~

~~All moisture concentration shall be expressed in terms of percent.~~

~~Source test results shall also include oxygen levels in the flue gas, FCCU feed rate, catalyst recirculation rate, coke burn-off rate, flue gas flow rate, flue gas moisture content, the flue gas temperature at the outlet of the ESP, opacity readings from the opacity meter, regenerator combustion temperature, FCCU feed pre-heat temperature, blower airflow rate and the average current, voltage, and spark rate at each ESP fields. Also, the report shall include oxygen injection rate, when tested.~~

~~This condition shall only apply to source test condition D29.7, source testing performed to demonstrate compliance of the oxygen injection system.~~

~~RULE 1303(b)(2) Offset, 5-10-1996; RULE 1303(b)(2) Offset, 12-6-2002; RULE 2005, 4-20-2001; RULE 401, 3-2-1984; RULE 401, 11-9-2001; RULE 404, 2-7-1986; RULE 405, 2-7-1986~~

Note: Condition K40.2 is being removed since it was included in A/N 418083 when Ultramar proposed to add an oxygen injection system to the regenerator. The PC was issued on November 21, 2003. To date, this oxygen injection system has been not constructed. Ultramar has requested that A/N 418083 be cancelled and, therefore, this condition as well as source testing condition D29.7 should be removed. A/N 418083 will remain active since A/N 418083 is one of three previous applications to the current A/N 494177.

K40.3 The operator shall provide to the District a source test report in accordance with the following specifications:

Source test results shall be submitted to the District no later than 60 days after the source test was conducted.

PM emission data from testing performed per condition D29.13 shall be reported in terms of mass rate (lbs/hr) and in terms of grains /DSCF.

CO emission data shall be reported in terms of mass rate (lbs/hr) and in terms of concentration (ppmv), corrected to 3 percent oxygen, dry basis.

Ammonia emission data shall be expressed in terms of concentration (ppmv), corrected to 3 percent oxygen, dry basis.

All exhaust flow rate shall be expressed in terms of dry standard cubic feet per minute (DSCFM) and dry actual cubic feet per minute (DACFM).

Source test results shall also include the following operating parameters under which the test was conducted:

Source test results shall include the following: FCCU feed rate in BPD; catalyst recirculation rate and make-up rate in BPD; catalyst inventory in the equipment; fresh catalyst feed; sulfur content (%) in the feed; coke burn-off rate; O2 content of exhaust gases; exhaust flow rate; exhaust gas moisture content; the flue gas temperature at the outlet of the ESP; ammonia injection rate prior to the ESP (if applicable) and the average current in amps, voltage in volts, and spark rate at each ESP in use.

This condition shall only apply to source test condition D29.13.

RULE 1105.1, 11-7-2003, RULE 404, RULE 405, RULE 407, RULE 1303(b)(2)-Offset

COMPLIANCE RECORD REVIEW

A check of the AQMD Compliance Database shows that this facility was issued 17 notices of violation (NOVs) and Notices to Comply (NCs) since January 1, 2007. No NOVs have been issued to the Fluid Catalytic Cracking Unit (FCCU) and its controls (ESP) in the past two years.

BACKGROUND

Ultramar (Valero Wilmington) Refinery operates a Fluid Catalytic Cracking Unit (FCCU Unit 61). On June 15, 2005, EPA and the Valero refineries entered into a settlement agreement under Consent Decree Civil Action No. SA-05-CA-0569 to reduce air emissions from Valero-owned refineries in California, Louisiana, New Jersey, Oklahoma, Texas, and Colorado. One of the requirements in the Consent Decree was that "no Covered FCCU will have a permit limit higher than 80 ppmvd [NOx] at 0% O_2 on a 365 day rolling average..." [Reference: Valero Consent Decree, SA-05-CA-0569, June 16, 2005, Section V, Paragraph 49]

As a result, Ultramar submitted the following applications for change of condition to add this NOx limit to the FCCU:

Table 1: AQMD Applications Submitted

A/N	Date Submitted	Equipment	Type	Status	Previous A/N
494177	12/17/2008	Fluidized Catalytic Cracking Unit (FCCU), Unit 61	60	20	462069 * 459911 ** 418083***
494183	12/17/2008	RECLAIM/Title V Minor Permit Revision	85	25	n/a

* Application submitted to modify FCCU by adding a new ESP to comply with the Rule 1105.1 PM10 emission limit

** Application submitted to include the terms and conditions described in the conditions in Attachment A of the August 4, 2006 extension letter. Permit to Construct issued on December 19, 2006.

*** Application submitted to add standby oxygen injection system for the regenerator. Permit to Construct issued November 21, 2003.

FEE SUMMARY

Table 2 : Fee Summary

A/N	Equipment	Type	Schedule	Fee Required, $	Fee Submitted, $
494177	Fluidized Catalytic Cracking Unit (FCCU), Unit 61	50	H	$13,873.64	$25,206.34

A/N	Equipment	Type	Schedule	Fee Required, $	Fee Submitted, $
494183	RECLAIM/Title V Minor Permit Revision	85	n/a	$1, 687.63	$843.80
				$15,561.27	$26,060.14

HISTORY

Table 3. Fluidized Catalytic Cracking Unit Application History

Application	Description of Application	Application Status	Permit Status
494177	2008: Ultramar filed A/N 494177 to include the NOx FCCU concentration limit from the Consent Decree.	21	
462069	2006: Ultramar filed A/N 462069 to modify the FCCU by constructing a new ESP to comply with the Rule 1105.1 PM10 emission limit. The PC was issued on June 21, 2007.	26	PC Active
459911	2006: Ultramar filed A/N 459911 to include the terms and conditions of the District's August 4, 2006 Rule 1105.1 extension letter. The PC was issued on December 19, 2006.	26	PC Active
418083	2003: Ultramar filed A/N 418083 to add an oxygen injection system to the regenerator. The PC was issued on November 21, 2003. To date, this oxygen injection system has been not constructed. Ultramar has requested that this application be cancelled.	26	PC Active
411737	2003: Ultramar filed A/N 411737 to replace and upgrade an existing blower motor from 6,000 hp to 8,000 hp (Device D1023) associated with the FCCU regenerator (D36). The PC was issued on June 18, 2003. This application was cancelled since it was superseded by A/N 418083.	52	PC Inactive
307709	1998: Ultramar filed A/N 307709 to remove the permit condition stating the applicability of 40CFR60 Subpart J for the operation of Ultramar's FCCU. Subpart J was amended to exempt FCCU's constructed or modified before January 17, 1984 [§60.100(c)]. The Permit to Operate (F13574) was issued May 6, 1998. However, according to records obtained, it appeared the modification to change in capacity from 30,000 bbl/day to 40,000 bbl/day occurred after January 17, 1984. Therefore, this permit was inactivated.	31	PO Inactive
178010	1998: Ultramar submitted a change of ownership A/N 178010 for the FCCU. The Permit to Operate (D07117) was	31	PO Active

Application	Description of Application	Application Status	Permit Status
	issued in April 17, 1989. **The Permit to Operate issued to this application is currently active.**		
228275	1990: Ultramar filed A/N 228275 upon receiving a NOV on a CEMS requirement. Ultramar applied to change a permit condition limiting the mass emission rate to a condition limiting the concentration. The PC was issued in 1992. However, the PO was not issued because Ultramar was not able to have their SO2 monitor certified and RECLAIM was adopted. As a result, this application was subsequently cancelled.	52	PC Inactive
165973	1988: Union Pacific Resources filed A/N 165943 for a change of condition on the daily CO emission limit. The Permit to Operate (D00207) was issued on September 15, 1988.	31	PO Inactive
105179	1982: Union Pacific Resources purchased the refinery and filed A/N 105179 for a change of ownership and to increase the FCCU capacity from 30,000 bbls/day to the current 40,000 bbls/day. The Permit to Operate (M54787) was issued on February 18, 1987 and reissued on May 21, 1987 and again on August 19, 1987.	31	PO Inactive
C25406	1979: Champlain Petroleum Company submitted A/N C25406 to install a 30,000 barrels per day UOP FCCU. The Permit to Construct was issued in 1980.	51	

PROCESS DESCRIPTION:

The FCCU converts (cracks) heavy gas oil into more valuable gasoline and lighter components. This reaction is accomplished by heating the gas oil and cracking it in the reactor (D35) in the presence of a catalyst. The fresh feed is preheated by heat exchangers to a temperature of 500-800 °F and enters the FCCU at the bottom of the feed riser where it is mixed with the hot catalyst. The heat from the catalyst vaporizes the feed and brings it up to the desired reaction temperature. The mixture of catalyst and hydrocarbon vapor travels up the riser into the reactor. The cracking reaction starts in the feed riser and continues in the reactor. Average reactor temperatures are in the range of 900-1000 °F. As the cracking reaction progresses, the catalyst surface is gradually coated with carbon (coke), reducing its efficiency. While the cracked hydrocarbon vapors are routed overhead for separation into lighter components, the oil remaining on the catalyst is removed by steam stripping before the spent catalyst is cycled to the regenerator to restore its activity.

The spent catalyst is regenerated in the regenerator (D36) where the coke is burned off (combusted) with air. During the regeneration cycle, flue gas formed by combustion of coke in the catalyst regenerator contains steam, oxygen, carbon monoxide, carbon dioxide, nitrogen, particulate matter, SOx, and NOx. In the regenerator cyclones, the combusting gases are separated from the catalyst.

Particulate Matter

Some of the catalyst is lost in the form of catalyst fines. The catalyst fines escape the regenerator in the flue gas. To control the particulate emissions, flue gas from the regenerator is routed through a series of cyclones to remove the larger particles. Following the cyclones, the flue gas currently passes through two sets of electrostatic precipitators (ESPs) operating in series for control of finer particulate matter and then exits the FCCU stack. The two sets of ESPs are (1) two Wheelabrator-Frye, Inc. ESP (C39) operated in parallel for control of finer particulate matter and (2) a new Hamon-Research Cottrell (HRC) ESP (C1615). The two Wheelabrator-Frye, Inc. ESPs (61-PR-1A/B) are currently permitted under Permit # D07159, Application # 178024. The new Hamon-Research Cottrell (HRC) ESP (C1615) was issued a Permit to Construct (A/N 458075) on June 21, 2007 and was installed in 2008 to comply with the PM10 emission limit in Rule 1105.1.

NOx

The FCCU feed consists of between 0.05% up to 0.5% organic nitrogen compounds. A majority of this nitrogen appears in the FCCU products. However, nearly half of the nitrogen ends up in the coke on the catalyst. When the coke is burned during regeneration, the nitrogen is liberated in various forms: 70-90% of the nitrogen in the coke is reduced to N_2, and the other 10-30% makes ammonia (NH_3), hydrogen cyanide (HCN), nitrous oxide (N_2O), and nitrogen oxides, which includes nitric oxide (NO) and nitrogen dioxide (NO_2). In addition, as with other combustion processes, high temperatures aid the reaction of nitrogen with oxygen to form additional NOx. Also, as the amount of regeneration air is increased, the peak temperature increases and the formation of NOx increases. Therefore, FCC regenerator off-gases contains a significant amount of NOx. Typical flue gas FCCU NOx concentrations range from about 10 ppmv to about 5000 ppmv and more commonly from about 50 ppmv to about 500 ppmv.[1] From January 28, 2007 to January 29, 2009, the daily NOx concentration from Ultramar's FCCU regenerator ranged from 6.1 ppmv to 84.3 pppmv. In addition, during this same timeframe, the maximum 365 day rolling average at 0% O_2 was 32.9 ppmv.

SOx

The amount of SOx emitted from an FCCU regenerator is a function of the quantity of sulfur in the feed, coke yield and conversion. Generally, 45% to 55% of feed sulfur is converted to H_2S in the FCCU reactor, 35% to 45% remains in the liquid products, and about 5% is deposited on the catalyst in the coke[2]. It is this sulfur in the coke which is oxidized to SOx in the FCCU regenerator (generally in a mixture of about 90% SO_2 and 10% SO_3).

CO

[1] World Intellectual Property Organization (WIPO), A Perovskite-type FCC NOx Reduction Additive, WO 1994019427 19940901, http://www.wipo.int/pctdb/en/wo.jsp?IA=US1993006655&WO=1994019427&DISPLAY=DESC.

[2] Bryne, J.W., Spernello, B.K., Leuenberger, E.L., Oil and Gas Journal, 101, October 15, 1984.

The catalyst regenerator can accommodate high temperature regeneration (1,200-1,450 °F) which allows complete combustion and produces low levels of CO. However, temperature fluctuations in the regenerator do occur and can adversely cause high CO emissions. Changes in feed quality, especially if unexpected, can also upset the operation for a time and cause CO emissions to occur.

EMISSIONS:

The emissions in New Source Review for the FCCU are as follows:

Table 4: FCCU Emissions

Pollutant	Emissions		
	Lbs/hr	Lbs/day	Lbs/year
VOC	0	0	0
NOx	**125**	**3,000**	**1,095,000**
SOx	94.38	2,265	826,725
CO	39.79	955	343,800
PM_{10}	7.20	173	62,280

As noted above, the Consent Decree requires the following NOx concentration FCCU emission limit:

- 80 ppm NOx at 0% oxygen, 365 day rolling average emission limit.

According to Ultramar, the current typical operating stack flow rate of the FCCU ranges from as low as 65,500 to as high as 108,000 dscfm. The NOx emission rate at 80 ppmv and the maximum stack flow rate of 108,000 dscfm is:

$$\text{NOx Emission Rate at 80 ppm} = \frac{42\ \text{lbs NO}_2}{\text{lb-mol}} * \frac{1\ \text{lb-mole}}{379\ \text{scf}} * \frac{1}{10\text{^}6\ \text{ppm}} * 80\ \text{ppm} * \frac{108{,}000\ \text{dscf}}{\text{min}} * \frac{60\ \text{min}}{\text{hr}} = \frac{62.9\ \text{lbs}}{\text{hr}}$$

The 80 ppmv concentration limit at the maximum stack flow rate is less than the 125 lbs/hr NSR NOx limit.

In checking the annual emissions of the FCCU based on AER and RECLAIM ERS data for the past eight years, the FCCU emission were well below the emissions shown in Table 4. The annual reported emissions for the past eight years are shown in Appendix A.

RULE EVALUATION:

PART 1 SCAQMD REGULATIONS

Rule 212	**Standards for Approving Permits** **November 14, 1997**
	This project is not considered a significant project. In accordance with Rule 212(c), a significant project is a new or modified facility in which: (1) the new or modified permit unit is located within 1000 feet of a school; (2) the new or modified facility has on-site emission increases exceeding the daily maximum specified in subdivision (g); or (3) the new or modified permit unit has an increased cancer risk greater than, or equal to, one in a million (1×10^{-6}) during a lifetime of 70 years or pose a risk of nuisance. A public notice is not required since the proposed permit unit is no located within 1000 feet of a school, the emissions from this project will not exceed the daily maximums specified in subdivision (g), and the permit unit will not result in a cancer risk greater than, or equal to, one in a million (1×10^{-6}).

Rule 401	**Visible Emissions** **November 9, 2001**
	Visible emissions are possible if the FCCU breaks down or if the control equipment shuts down. However, with changes in emergency shutdown processes and continuous operation of the NSPS, Subpart J-required opacity meter, it is expected that visible emissions would not be an issue under normal operating conditions.

Rule 402	**Nuisance** **May 7, 1976**
	Nuisance complaints associated are not expected under normal operating conditions.

Rule 404	**Particulate Matter-Concentration** **February 7, 1986**
	Based on latest source test which was conducted on December 30-31, 2008 by AirKinetics, Inc. (AKi), the maximum flue gas was 101,611 dscfm and the measured PM concentration was **0.00446 grains/dscf**. At 101,611 dscfm (6,096,660 dscf/hr), the interpolated Rule 404 allowable concentration limit for PM is **0.0332 grains/dscf**. Therefore, the unit currently complies with this rule.

Rule 405	**Solid Particulate Matter-Weight** **February 7, 1986**
	Based on latest source test which was conducted on December 30-31, 2008 by AirKinetics, Inc. (AKi), the maximum measured solid PM weight was **3.88 lbs/hr**. At a catalyst circulation rate (process weight) of 39.822 tons/min (4,778,640 lbs/hr), the Rule 405 allowable concentration limit for solid PM is **30.0 lbs/hr**. Therefore, the unit

Rule 405	**Solid Particulate Matter-Weight**	**February 7, 1986**
	currently complies with this rule.	

Rule 407	**Liquid and Gaseous Air Contaminants**	**April 2, 1982**
	Based on latest source test which was conducted on April 2, 2007 (Project: 8487) by Almega Environmental & Technical Services, the CO emissions was measured as **11.25 ppmv**. The Rule 409 CO emission limit is 2,000 ppmv. The SOx emission limit does not apply since Ultramar is a SOx RECLAIM facility and the SOx portion of Rule 409 has been subsumed by Reg XX, pursuant to Rule 2001(j). Therefore, the unit complies with this rule.	

Rule 1105	**Fluid Catalytic Cracking Unit – Oxides of Sulfur**	**September 1, 1984**
	Since Ultramar is a SOx RECLAIM facility, Rule 1105 has been subsumed by Reg XX, pursuant to Rule 2001(j).	

Rule 1105.1	**Reduction of PM_{10} and Ammonia Emissions from Fluid Catalytic Cracking Units**	**November 7, 2003**
1105.1(d)(1)	Emission Limits. With the extension granted, Ultramar has until December 31, 2008 to comply with the PM_{10} and ammonia limits listed below: (A) Filterable PM10 (i) 3.6 lbs/hr, or (ii) 0.005 gr/dscf, corrected to 3% O_2 dry, or (iii) 2.8 lbs/1,000 barrels of fresh feed (B) Ammonia Slip - 10 ppmv corrected to 3% O_2 dry, averaged over 60 consecutive minutes. For filterable PM_{10}, Ultramar has elected to comply with the Rule 1105.1(d)(1)(A)(iii)-2.8 lbs/1,000 barrels of fresh feed. Ultramar installed a new ESP system in 2008 to comply with this PM10 emission limit. Ultramar completed the construction of the ESP and tie-ins to the existing ESP in December 2008. Source tests were conducted on December 30-31, 2008. The results were forwarded to the District's Engineering and Source Testing Divisions on March 30, 2009. Based on the source test results, the highest filterable PM10 emission rate was found to be 1.85 lb/1,000 barrels for fresh feed. The source test results are currently under review by the District's Source Testing	

Rule 1105.1	**Reduction of PM_{10} and Ammonia Emissions from Fluid Catalytic Cracking Units** **November 7, 2003**
	Division.
1105.1(e)	Monitoring, Reporting and Recordkeeping Requirements.

(1) Performance Testing. Ultramar has conducted a performance source test for PM_{10} and ammonia no later than 180 calendar days after initial start-up of the equipment. During the performance test, the operator was to establish the operating levels for each parameter of the ESP to be monitored pursuant to paragraph (e)(3). The operator was to monitor and record, at a minimum, all operating data for each parameter, fresh feed rate, and flue gas flow rate, and submit this data with the test report.

(2) Compliance Testing. Ultramar is also required to conduct, at a minimum, annual compliance source test for PM_{10} and ammonia emissions to demonstrate compliance with the 2.8 lbs/1,000 barrels of fresh feed filterable PM_{10} and 10 ppmv ammonia limit. During this annual compliance test, Ultramar shall monitor and record, at a minimum, all operating data for the selected operating parameters of the FCCU control equipment, fresh feed rate and flue gas flow rate.

(3) Monitoring.

(A) Ultramar was required to submit a plan specifying the operating parameters monitored, the range of operating levels of each proposed parameter, and the frequency of monitoring and recording, for the ESP system installed at the facility before November 7, 2003 (the rule adoption date). Ultramar submitted compliance plan A/N 429564 on May 11, 2004. Below is a summary of the information submitted. This plan was approved on March 20, 2007.

Operating Parameters	Typical Operating Range	Monitoring Frequency	Recording Frequency
Flue gas inlet temperature to ESP	450 to 700 deg F	Continuous	Hourly
Flue gas flow rate	68,000 to 110,000 dscfm	Continuous	Hourly
61PR1A -602A	125 – 225 AC volts	Once / day	Once / day
61PR1A -602A	30 – 60 AC amps	Once / day	Once / day
61PR1A -602B	125 – 225 AC volts	Once / day	Once / day
61PR1A -602B	30 – 60 AC amps	Once / day	Once / day
61PR1B -603A	125 – 225 AC volts	Once / day	Once / day
61PR1B -603A	30 – 60 AC amps	Once / day	Once / day

Rule 1105.1 — **Reduction of PM_{10} and Ammonia Emissions from Fluid Catalytic Cracking Units** — **November 7, 2003**

61PR1B -603B	125 – 225 AC volts	Once / day	Once / day
61PR1B -603B	30 – 60 AC amps	Once / day	Once / day
Ammonia injection rate	0 – 180 scfh	N/A	Not injected

(B) Ultramar was required to submit a plan specifying the operating parameters to be monitored, the range of operating levels of each proposed parameter, and the frequency of monitoring and recording, for the ESP system constructed after November 7, 2003 (the rule adoption date). Ultramar submitted compliance plan A/N 460671 on September 19, 2006. This plan was approved on March 20, 2007.

The preliminary operating parameters to be monitored, the range of operating levels of each proposed parameter, and the frequency of monitoring and recording, for the new ESP system are as follows:

Operating Parameter	Typical Operating Range	Monitoring Frequency	Recording Frequency
Flue gas inlet temperature to ESP	~450 to ~750 Deg F	Continuous	Hourly
Flue gas flow rate	< ~110,000 Dscfm	Continuous	Hourly
Voltage across ESP	~0 to ~480 Volts	Continuous	Hourly
Current across ESP	~400 to ~1000 Amps	Continuous	Hourly
Number of operating transformer-rectifiers	6 to 12 (out of 12 total for ESP system)	Continuous	Hourly
Ammonia injection rate	0 to ~180 scfh	Continuous	Hourly

Rule 1123	**Refinery process turnarounds**	**December 7, 1990**
	Ultramar operates under procedures to ensure compliance with Rule 1123 vessel depressuring and recordkeeping requirement during process unit turnarounds. Compliance is expected.	

Rule 1173	**Fugitive Emissions of Volatile Organic Compounds** **December 6, 2002**
	Ultramar has assured the District that no new fugitive components will be installed as a result of this change of condition.

REG XIII	**New Source Review** **May 10, 1996** **(Application deem complete date: 2009)**
	As noted in the History section, the FCCU was originally issued a PC in 1979 and is a post-NSR source. The NSR emissions are shown in Table 4 above. This change of condition will not increase the FCCU emissions. Ultramar is simply incorporating the FCCU NOx concentration limits mandated by the Consent Decree. Based on the maximum stack flow rate of the FCCU, the 80 ppmv NOx emission is equivalent to approximately 62.9 lbs/hr, which is less than the NOx NSR limit of 125 lbs/hr (See Emissions Section for calculation).
1303(a)	Best Available Control Technology (BACT): BACT is not required for the FCCU since there is no emission increase with this change of condition.
1303(b)	There is no emission increase with this change of condition. Therefore, the requirements of 1303(b) do not apply.

Rule 1401	**New Source Review of Toxic Air Contaminants** **March 4, 2005** **Application Deem Complete Date: 2006**
	Rule 1401 should not apply to this change of condition since this rule applies to new, relocated, and modified permit units. Rule 1401(c)(9) defines *modification* as "*any physical change in, change in method of operation, or addition to an existing permit unit that requires an application....*" Therefore, since this change in condition is not a modification according to Rule 1401(c)(9), Rule 1401 does not apply in this case.

Regulation XX	**RECLAIM**
Rule 2005	There is no emission increase of any NOx or SOx air contaminant from this change of condition. There is no change in the method of operation. This change of condition application is to simply to add the NOx concentration limits from the Valero Consent Decree.

Regulation XXX	**Title V** **March 16, 2001**
	Ultramar is a designated as a Title V facility. Ultramar's Title V permit became effective on May 29, 2009. Therefore, the facility is now subject to the requirements of Reg XXX. This application is considered a Minor Permit Revision as defined in Rule 3000 and subject to 45 day review by EPA.

PART 2 STATE REGULATIONS

California Environmental Quality Act (CEQA)
CEQA does not apply to this change of condition application since there is no change in emissions.

PART 3 FEDERAL REGULATIONS

Regulation IX: Standards of Performance for New Stationary Sources (NSPS)

40 CFR Part 60 Subpart J	**Standards of Performance for Petroleum Refineries**
§60.100	Applicability and designation of affected facility, and reconstruction. The permitting history of the FCCU is shown in the History section. In accordance with §60.100(a), the provisions of Subpart J apply to FCCU catalyst regenerators. In addition, with respect to §60.100(b), any FCCU catalyst regenerator which commences construction or modification after June 11, 1973 is subject to the requirements of this subpart. Since the FCCU was installed in 1979 and modified in the 1980's, the FCCU catalyst regenerator is subject to provisions of Subpart J.
§60.102	Standard for particulate matter. §60.102(a) specifies that the FCCU catalyst regenerator may not discharge: (1) Particulate matter in excess of 2.0 lb/ton of coke burn-off in the catalyst regenerator. (2) Gases exhibiting greater than 30 percent opacity, except for one six-minute average opacity reading in any one hour period. PM: Based on the information provided in the latest source test conducted on December 30-31, 2008 by AKI, the maximum PM emission rate based on coke burnoff was calculated to be 0.262 lb/ton of coke burn-off. The District calculated PM emission rate based on the coke burnoff rate using the source test results. The PM emission rate was calculated to be 0.233 lb/ ton of coke burn-off. See Appendix B of this calculation.

40 CFR Part 60 Subpart J	Standards of Performance for Petroleum Refineries
	Opacity: In Ultramar's semi-annual opacity Periodic Monitoring and Exception Reports from July 1 through December 31, 2008 submitted to EPA, Ultramar reported no duration where the opacity reading was above 30 percent. Therefore, the FCCU catalyst regenerator complies with the PM and opacity standards of this subpart.
§60.103	Standard for carbon monoxide. §60.103 specifies that the FCCU catalyst regenerator may not discharge: (a) any gases that contain carbon monoxide (CO) in excess of 500 ppm by volume (dry basis). Based on latest source test which was conducted on April 2, 2007 (Project: 8487) by Almega Environmental & Technical Services, the CO emissions was measured as 11.25 ppmv. In Ultramar's semi-annual CO Periodic Monitoring and Exception Reports from July 1 through December 31, 2008, Ultramar reported 18 hours where the CO emissions exceeded 500 ppmv. The exceedance occurred on September 2, 2008 at 12:30 p.m. during the emergency shutdown and eventual startup of the FCCU. The FCCU experienced a loss of feed and subsequently a fire on the FCCU main column vapor inlet line; both events caused the FCCU to shutdown. The cause of feed loss was due to a faulty check valve on one of the FCCU feed pumps. The check valve was replaced and the FCCU return to service on September 3, 2008 around 7 a.m. The District's compliance staff was notified of this event on September 2, 2008 at 1:30 p.m. (Breakdown Notification # 196977). The exceedance represented 0.45% of the total operation hours of the FCCU during July 1 through December 31, 2008. Therefore, the FCCU catalyst regenerator complies with the CO standard of this subpart.
§60.104	Standards for sulfur oxides. §60.104(b) specifies that the FCCU catalyst regenerator shall comply with one of the following conditions: (1) With an add-on control device, reduce sulfur dioxide emissions to the atmosphere by 90 percent or maintain sulfur dioxide emissions to the atmosphere less than or equal to 50 ppm by volume, whichever is less stringent; or (2) Without the use of an add-on control device, maintain sulfur oxides emissions calculated as sulfur dioxide to the atmosphere less than or equal to 9.8 kg/Mg (20 lb/ton) coke burn-off; or (3) Process in the fluid catalytic cracking unit fresh feed that has a total sulfur content no greater than 0.30 percent by weight. Ultramar opts to comply with the SOx standard by complying with §60.104(b)(3) where the FCCU feed has a total sulfur content no greater than 0.30 percent by weight. Ultramar samples the FCCU feed every 8 hours for total sulfur analyses. A review of the

40 CFR Part 60 Subpart J	Standards of Performance for Petroleum Refineries
	laboratory analytical results from January 1, 2006 to August 31, 2006 indicates the FCCU feed consistently contains less than 0.3% by weight sulfur. In addition, in Ultramar's semi-annual Periodic Monitoring and Exception Reports from January 1 through July 1, 2008 through December 31, 2008 submitted to EPA, Ultramar certified that the *"FCCU Unit 61 fresh feed had a total sulfur content of no more than 0.30 percent by weight sulfur content, based on a seven-day rolling average, for the reporting period."* Therefore, the FCCU catalyst regenerator complies with the SOx standard of this subpart.
§60.105	Monitoring of emissions and operations. In accordance with §60.105(a), Ultramar maintains and operates the following continuous monitoring systems: • Opacity CEMS (or COMS) • CO CEMS • SOx CEMS Also, in accordance with §60.105(c), the average coke burn-off rate can be calculated and hours of operation is recorded daily. Therefore, the refinery complies with the monitoring of emissions and operations of this subpart.

40 CFR Part 60 Subpart GGG	Standards of Performance for Equipment Leaks of VOC in Petroleum Refineries
§60.590	The propose project should not trigger NSPS Subpart GGG applicability. The proposed project does not construct or modify a process unit or compressor, which are the affected facilities regulated under Subpart GGG.

Regulation X: National Emission Standards for Hazardous Air Pollutants (NESHAPS)

40 CFR Part 63 Subpart CC	National Emission Standards for Hazardous Air Pollutant from Petroleum Refineries
§63.640	Applicability and designation of affected source. This subpart pertains to tanks, fugitive equipment leaks, and wastewater systems as well as other emission points. In accordance with §63.640(d)(4), a *catalytic cracking unit* is not considered an affected source subject to this subpart. Therefore, this subpart is not applicable to the FCCU.

40 CFR Part 63 Subpart UUU	National Emission Standards for Hazardous Air Pollutants for Petroleum Refineries: Catalytic Cracking Units, Catalytic Reforming Units, and Sulfur Recovery Units

40 CFR Part 63 Subpart UUU	National Emission Standards for Hazardous Air Pollutants for Petroleum Refineries: Catalytic Cracking Units, Catalytic Reforming Units, and Sulfur Recovery Units
§63.1560	This subpart established national emission standards for hazardous air pollutants (HAP) emitted from petroleum refineries.
§63.1561	Ultramar refinery is subject to this subpart since it is a petroleum refinery with North American Industry Classification (NAIC) code 32411 and is a major source of HAP.
§63.1562(a)	The FCCU is an existing affected source subject to this subpart
§63.1562(b)(1)	Since the FCCU consists of a regenerator that regenerates catalyst, it is considered an affected source.
§63.1563(b)	As an existing affected source, Ultramar was required to comply with this subpart by April 11, 2005.
§63.1564(a)(1)	The regenerator is required to meet the following PM emission limits specified in §60.102 (40CFR 60 Subpart J): (1) Particulate matter in excess of 2.0 lb/ton of coke burn-off in the catalyst regenerator. (2) Gases exhibiting greater than 30 percent opacity, except for one six-minute average opacity reading in any one hour period. Based on the information provided in the latest PM source test conducted on December 31, 2008 by AKI, the PM emission rate based on coke burnoff was calculated to be 0.262 lb/ton of coke burnoff. The District calculated the emission rate based on the coke burnoff based on the source test results and calculated the emission rate to be 0.233 lbs/ton of coke burn-off. The calculation is shown in Appendix B. In Ultramar's semi-annual opacity Periodic Monitoring and Exception Reports from January 1 through June 30, 2008 submitted to EPA, there were no opacity readings above 30 percent. Therefore, the FCCU catalyst regenerator complies with the PM standards of this subpart.
§63.1564(a)(2)	Since the regenerator is subject to §60.102, Ultramar is required to install a continuous opacity monitoring system, which they have installed. Compliance is expected.
§63.1564(a)(3)	Ultramar is required to prepare an operation, maintenance, and monitoring plan (OMMP) according to the requirements in §63.4574(f) for each control system and continuous monitoring system and operate at all times according to the procedures in the plan. Ultramar submitted an OMMP (A/N 448638) for the continuous opacity monitoring system (and CO CEMS) for the FCCU on September 9, 2005.

40 CFR Part 63 Subpart UUU	National Emission Standards for Hazardous Air Pollutants for Petroleum Refineries: Catalytic Cracking Units, Catalytic Reforming Units, and Sulfur Recovery Units
§63.1565(a)(1)	The regenerator is required to meet the following CO emission limits specified in §60.103 (40CFR 60 Subpart J): (a) any gases that contain carbon monoxide (CO) in excess of 500 ppm by volume (dry basis). Based on a source test which was conducted on April 2, 2007 (Project: 8487) by Almega Environmental & Technical Services, the CO emissions was measured as 11.25 ppmv. In Ultramar's semi-annual CO Periodic Monitoring and Exception Reports from July 1 through December 31, 2008, Ultramar reported 18 hours where the CO emissions exceeded 500 ppmv. The exceedance occurred on September 2, 2008 at 12:30 p.m. during the emergency shutdown and eventual startup of the FCCU. The FCCU experienced a loss of feed and subsequently a fire on the FCCU main column vapor inlet line; both events caused the FCCU to shutdown. The cause of feed loss was due to a faulty check valve on one of the FCCU feed pumps. The check valve was replaced and the FCCU return to service on September 3, 2008 around 7 a.m. Therefore, the FCCU catalyst regenerator complies with the CO standards of this subpart.
§63.1565(a)(2)	Since the regenerator is subject to §60.103, Ultramar complies with this subpart with its use of a certified CO CEMS.
§63.1565(a)(3)	Ultramar is required to prepare an operation, maintenance, and monitoring plan (OMMP) according to the requirements in §63.4574(f) for each control system and continuous monitoring system and operate at all times according to the procedures in the plan. Ultramar submitted an OMMP (A/N 448638) for the CO CEMS (and continuous opacity monitoring system) for the FCCU on September 9, 2005.

RECOMMENDATION:

Issue Permits to Construct to the following applications with the conditions listed in the Conditions Section.

A/N	Equipment
494177	Fluidized Catalytic Cracking Unit (FCCU), Unit 61
494183	RECLAIM/Title V Minor Permit Revision

Appendix A
Annual Reported Emissions for FCCU and PM Control Device (ESP), FY 2000-2001 to CY 2008

AER Year	Throughput, hrs	ROG				CO				PM*				Source
		ROG Emission Factor	lbs/year	lbs/day	lbs/hr	CO Emission Factor	lbs/year	lbs/day	lbs/hr	PM Emission Factor	lbs/year	lbs/day	lbs/hr	
2008	7,824	4.504136	35,240	97.89	4.08	18.880937	147,724	410.35	17.10	14.74	115,326	320.35	13.35	Form B4 &R5
2007:July-Dec	2,904	4.525595	13,142	73.01	3.04	8.493574	24,665	137.03	5.71	23.41	67,983	377.68	15.74	
2006-2007	8,640	4.825461	41,692	115.81	4.83	9.217123	79,636	221.21	9.22	13.96	122,290	339.69	4.15	
2005-2006	8,640	4.039554	34,902	96.95	4.04	11.552426	99,813	277.26	11.55	13.98	120,787	335.52	13.98	
2004-2005	8,616	4.471800	38,529	107.03	4.46	13.026400	112,235	311.77	12.99	8.07	69,531	193.14	8.05	
2003-2004	7,416	3.798800	28,172	78.26	3.26	14.264800	105,788	293.85	12.24	4.52	33,520	93.11	3.88	
2002-2003	7,464	3.816400	28,486	79.13	3.30	18.390000	137,263	381.29	15.89	14.57	108,750	302.08	12.59	
2001-2002	7,848	4.092000	32,114	89.21	3.72	18.390000	144,325	400.90	16.70	29.40	230,731	640.92	26.71	
2000-2001	8,544	4.716700	40,299	111.94	4.66	2.320000	19,822	55.06	2.29	22.77	194,547	540.41	22.52	

* In 2006-2007, Ultramar used a throughput of 8,760 hours (instead of 8,640 hours) to calculate the emissions for the FCCU PM Control

AER Year	Throughput, hrs	NOx			SOx			Source
		lbs/year	lbs/day	lbs/hr	lbs/year	lbs/day	lbs/hr	
2008	7,824	197,003	539.73	22.49	534,689	1,464.90	61.04	RECLAIM ERS
2007:July-Dec	2,904	74,774	409.72	17.07	168,789	924.87	38.54	
2006-2007	8,640	225,059	625.16	26.05	611,483	1,698.56	70.77	
2005-2006	8,640	131,934	366.48	15.27	580,517	1,612.55	67.19	
2004-2005	8,616	199,573	554.37	23.10	396,899	1,102.50	45.94	
2003-2004	7,416	175,407	487.24	20.30	326,970	905.47	37.73	
2002-2003	7,464	138,279	384.11	16.00	432,143	1,200.40	50.02	
2001-2002	7,848	145,136	403.16	16.80	549,986	1,527.74	63.66	
2000-2001	8,544	226,104	628.07	26.17	611,015	1,697.26	70.72	

Appendix B -

Calculation of 40 CFR Part 60 Subpart J PM Emission Rate

Allowable PM Emission Rate:	2 lbs/ ton of coke burnoff

According to Section 60.106, the PM emission rate is computed using the following equation:

$$E = \frac{C_s Q_{sd}}{K R_c}$$

where,

E	=	Emission rate of PM, lb/ton		
C_s	=	Concentration of PM, gr/dscf	=	0.00473
Q_{sd}		Volumetric flow rate of effluent gas, dscf/hr	=	6,046,080 **(100,768** dscf/min)
K	=	Conversion factor, 7000 grains/lb		
R_c	=	Coke burnoff rate (ton/hr)		

The coke burn-off rate (R_c) is computed using the following equation:

$$\mathbf{R_c = K_1 Q_r (\%CO_2 + \%CO) + K_2 Q_a - K_3 Q_r (\%CO/2 + \%CO_2 + \%O_2) + K_3 Q_{oxy} (\%O_{oxy})}$$

where,

R_c	=	Coke burnoff rate, ton/hr		
Q_r	=	Volumetric flow rate of exhaust gas from catalyst regenerator before entering ESP, dscf/min	=	**100,768**
Q_a	=	Volumetric flow rate of air to FCCU regenerator (determined from FCCU control unit instrumentation), dscf/min	=	**100,768**
Q_{oxy}	=	Volumetric flow rate of O_2enriched air to fluid catalytic cracking unit regenerator (determined from the fluid catalytic cracking unit control room instrumentation), dscm/min	=	**100,768**
$\%CO_2$	=	Carbon dioxide concentration, % by volume	=	17.5
%CO	=	Carbon monoxide concentration, % by volume	=	0
$\%O_2$	=	Oxygen concentration, % by volume	=	1.2
K_1	=	Material balance and conversion factor, 9.31×10^{-6} tons-min/hr-dscf-%		

K_2 = Material balance and conversion factor, 6.52×10^{-5} tons-min/hr-dscf-%

K_3 = Material balance and conversion factor, 3.1×10^{-6} tons-min/hr-dscf-%

R_c	=	$(9.31 \times 10^{-6}$ tons-min/hr-dscf-%)(**100,768** dscf/min) (17.5% + 0%) + $(6.52 \times 10^{-5}$ tons-min/hr-dscf-% * **100,768** dscf/min) - $(3.1 \times 10^{-6}$ tons-min/hr-dscf-% * **100,768** dscf/min) (0%/2 + 17.5% +1.2%) + $(3.1 \times 10^{-6}$ tons-min/hr-dscf-% * **100,768** dscf/min) (1.2%)
	=	$16.418 \frac{\text{tons}}{\text{hr}} + 6.570 \frac{\text{tons}}{\text{hr}} - 5.842 \frac{\text{tons}}{\text{hr}} + 0.375 \frac{\text{tons}}{\text{hr}}$
	=	$17.521 \frac{\text{tons}}{\text{hr}}$

E	=	$\frac{0.00473 \frac{\text{grains}}{\text{dscf}} * 100{,}768 \frac{\text{dscf}}{\text{min}} * 60 \frac{\text{min}}{\text{hr}}}{17.521 \frac{\text{tons}}{\text{hr}} * 7000 \frac{\text{grains}}{\text{lb}}}$
	=	$0.233 \frac{\text{lbs}}{\text{ton coke burnoff}}$ *Meets 40 CFR Part 60 Subpart J PM Emission Rate*