

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT ENGINEERING AND COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES 14	PAGE 1
	APPL NO 482011-3,495826 509013,524810	DATE 10-1-13
	PROCESSED BY LLD	CHECKED BY 

OWNER/OPERATOR:

COID: 800279

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APPLICATIONS IN THIS BATCH

- A/N 482011: VAPOR RECOVERY UNIT
- A/N 482012: BULK LOAD/UNLOAD RACK NO. 1
- A/N 482013: BULK LOAD/UNLOAD, RACK NO. 2
- A/N 509013: WASTE OIL/WATER SEPARATION SYSTEM
(cancel)
- A/N 511411: STORAGE TANK OR-6
(Admin Change-Tank Dimensions)

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT ENGINEERING AND COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES 14	PAGE 2
	APPL NO 482011-3,495826 509013,524810	DATE 10-1-13
	PROCESSED BY LLD	CHECKED BY

A/N 524810: WASTE OIL/WATER SEPARATION SYSTEM

A/N 495826: TV REVISION

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT ENGINEERING AND COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES 14	PAGE 3
	APPL NO 482011-3,495826 509013,524810	DATE 10-1-13
	PROCESSED BY LLD	CHECKED BY CDT

INTRODUCTION:

These applications were received as follows:

- A/N 482011: VAPOR RECOVERY UNIT,
- A/N 482012: BULK LOAD/UNLOAD RACK NO. 1
- A/N 482013: BULK LOAD/UNLOAD RACK NO. 2
- A/N 509013: WASTE OIL/WATER SEPARATION SYSTEM
(cancel application- incorporate into A/N 524810)
- A/N 511411: STORAGE TANK OR-6
- A/N 524810: WASTE OIL/WATER SEPARATION SYSTEM
- A/N 495826: TV REVISION

There have been no complaints, NCs or NOV's during the last two years. Most recent inspection was conducted 9/29/11. Facility is in compliance.

There are no schools within 1000 feet of this facility.

HISTORY:

SFPP Orange operates a bulk loading/unloading station. The company receives diesel and gasoline from in-bound pipelines. Ethanol is received via tanker truck. Products are stored in tanks. The facility also has a thermal oxidizer for vapor control.

Because the SFPP terminal functions as a distribution center for petroleum products, it is also responsible for blending of petroleum products to specifications before delivery to customers. To provide this formulation service, SFPP uses inline blending of the petroleum products before the product is loaded into tanker trucks.

Current permit conditions limit the total facility loading to 3,300,000 gpd (CARB limit) and 63,000,000 gal/month (offset limit).

These applications were submitted as follows:

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT ENGINEERING AND COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES 14	PAGE 4
	APPL NO 482011-3,495826 509013,524810	DATE 10-1-13
	PROCESSED BY LLD	CHECKED BY

A/N	Previous A/N : P/O	Equipment	Reasons for application
482011	457854 : F84416 364988: F31704 313931: (only P/C issued in 3/97 to add afterburner to ref. unit to meet 0.08 lb.1000 gal)	Vapor Recovery – Afterburner (serving Racks No. 1 and No. 2	Correct description from “average rated” capacity of 45 mmbtu/hr to “maximum rated” capacity of 63 mmbtu/hr in equipment description Equipment ID and HP changes/corrections Add Periodic Monitoring conditions Add monthly emission limitation per R1313(g) Change test frequency from annual to every three years (modification)
482012	457852: F84427	Bulk Loading Rack No. 1 gasoline and diesel (thirteen position)	Update loading arms description Remove “bypass” mode references since refrigeration units have been removed (by-pass language already removed from VRS permit) (no change in emissions) (Admin Change of condition)
482013	457853: F84415	Bulk Loading Rack No. 2 gasoline and diesel (sixteen position)	Remove “bypass” mode references since refrigeration units have

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT ENGINEERING AND COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES 14	PAGE 5
	APPL NO 482011-3,495826 509013,524810	DATE 10-1-13
	PROCESSED BY LLD	CHECKED BY

			been removed (by-pass language already removed from VRS permit) (no change in emissions) (Admin Change of condition)
511411	444804:F77349	Storage Tank OR-6	Correct typos in tank size/dimension (Admin change)
524810	181405:D11294 NSR = 0 164568:no P/O	Waste Oil/Water Separation System	Replace existing ww evaporation tank with double wall tank, increase thruput from 3000 gal/yr to 1,620,000 gal/yr (Modification with less than 0.5 lb/day emissions increase)
459635	(February 23, 2010 - Rev. 1)	TV Facility Permit	TV Revision (De Minimus Significant)

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT ENGINEERING AND COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES 14	PAGE 6
	APPL NO 482011-3,495826 509013,524810	DATE 10-1-13
	PROCESSED BY LLD	CHECKED BY

A/N 482011: Vapor Recovery System/Afterburner
A/N 482012: Bulk Loading System No. 1
A/N 482013: Bulk Loading System No. 2

INTRODUCTION:

These applications were submitted 5/06/08 as a Class III to correct the description of the afterburner from 45 mmbtu/hr (average) to 63 mmbtu/hr (maximum) in the permit equipment description and to remove the "bypass mode" in the conditions of two loading racks since the refrigeration system was removed. Additionally, some equipment IDs and hp ratings will be corrected.

HISTORY:

The afterburner was installed under a P/C under A/N 313931 on 3/18/97 with a 45 mmbtu/hr rating.

There is an email in the file dated 5/09/2000 to Eugen Teszler from Connie Moore of KinderMorgan to remove the Edwards refrigeration units from the permit since CARB testing shows that the emission is well below the 0.08 lb/1000 gallons gasoline loaded without the refrigeration units. The refrigeration system was removed from the description of the vapor recovery system, but the rack conditions still contained language referencing a "by-pass" mode, where "by-pass" is defined as the when the displaced gases are vented directly to the afterburner, thus by-passing the refrigeration system.

In June 2000, rack application 364987 was submitted to request a facility throughput increase. The resulting emissions increase was offset by concurrent VRU modification where the VOC limit was reduced from 0.08 to 0.045 lb/1000 gallons loaded.

PROJECT DESCRIPTION:

Per the 1997 "Design Basis and Performance Summary" from John Zink (Appendix B of May 2008 submittal), the minimum and maximum hydrocarbon content is 150 and 1400 btu/cf, respectively.

The minimum and maximum vapor flow is 80 scfm and 750 scfm, respectively. Test results from the last 4 years (2010-2013) show the average inlet vapor flow rate ranges from 80 – 107 scfm. These are below the 750 scfm limit.

Therefore:

$$\begin{aligned}
 \text{Minimum heat input} &= 150 \text{ btu/cf} * 80 \text{ scf/min} * 60 \text{ min/hr} * \text{mm}/1\text{E6} \\
 &= 0.72 \text{ mmbtu/hr}
 \end{aligned}$$

$$\text{Average heat input} = 1000 \text{ btu/cf} * 750 \text{ scf/min} * 60 \text{ min/hr} * \text{mm}/1\text{E6}$$

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT ENGINEERING AND COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES 14	PAGE 7
	APPL NO 482011-3,495826 509013,524810	DATE 10-1-13
	PROCESSED BY LLD	CHECKED BY

(assumed) = 45 mmbtu/hr

Maximum heat input = 1400 btu/cf * 750 scf/min * 60 min/hr * mm/1E6
= 63 mmbtu/hr

This shows the "design" basis for the afterburner has a max rating rating of 63 mmbtu/hr. When the equipment was evaluated under A/N 313931, the "average" rating of 45 mmbtu/hr was used instead and added to the permit description. The max flow to the afterburner will remain at 750 scfm.

Additionally, the "by-pass mode" language will be removed from the rack permits. "By-pass mode" is described under A/N 313931 where the vapor holder and the afterburner are on-line and the refrigeration unit is off-line. With the removal of the refrigeration unit, the "by-pass" mode is an obsolete description.

CALCULATIONS:

Emissions are based on the following:

	Emission Factor	Source
NOx	0.068 lb/mmbtu	AP-42 Table 13.5-1: Emission Factors for Flare Operations
CO	0.2 lb/mmbtu	Flare E.F. for LFG flares
ROG	0.045 lb/mmgal loaded (Rack emissions)	R1303-offset limit
PM10	7.5 lb/mmscf	AQMD EFB Appendix A - Table 1 Form B-1 External Combustion, Other, Natural Gas
SOx	0.83 lb/mmscf	AQMD EFB Appendix A - Table 1 Form B-1 External Combustion, Other, Natural Gas

NOx = (0.068 lb/mmbtu)(63 mmbtu/hr)
= 4.28 lb/hr
*24 = 102.8 lb/day

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT ENGINEERING AND COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES 14	PAGE 8
	APPL NO 482011-3,495826 509013,524810	DATE 10-1-13
	PROCESSED BY LLD	CHECKED BY

$$\begin{aligned}
 *365 &= 37527.8 \text{ lb/yr} \\
 *1/12 &= 3127.3 \text{ lb/month} \\
 &(104.1 \text{ lb/day; 30-day avg})
 \end{aligned}$$

$$\begin{aligned}
 \text{CO} &= (0.20 \text{ lb/mmBTU})(63 \text{ mmbtu/hr}) \\
 &= 12.6 \text{ lb/hr} \\
 *24 &= 302.4 \text{ lb/day} \\
 *365 &= 110376.0 \text{ lb/yr} \\
 *1/12 &= 9198 \text{ lb/month} \\
 &(307 \text{ lb/day, 30-day avg})
 \end{aligned}$$

Assume EF from District's From B-1 (assuming equivalent natural gas flow):

Note that per John Zink, SOx and PM emissions are estimated to be "near zero", so using B-1 factors is a conservative method.

$$\begin{aligned}
 \text{SOx} &= 0.83 \text{ lb/mmcf} * 750 \text{ scf/min} * 60 \text{ min/hr} * \text{mm}/10\text{E-6} \\
 &= 0.037 \text{ lb/hr} \\
 *24 &= 0.89 \text{ lb/day} \\
 *365 &= 327.2 \text{ lb/yr} \\
 *1/12 &= 27 \text{ lb/mo} \\
 *1/30 &= 0.9 \text{ lb/day (30 day)}
 \end{aligned}$$

$$\begin{aligned}
 \text{PM} = \text{PM}_{10} &= 7.5 \text{ lb/mmcf} * 750 \text{ scf/min} * 60 \text{ min/hr} * \text{mm}/10\text{E-6} \\
 &= 0.33 \text{ lb/hr} \\
 *24 &= 8.1 \text{ lb/day} \\
 *365 &= 2956.5 \text{ lb/yr} \\
 *1/12 &= 246 \text{ lb/mo} \\
 *1/30 &= 8.2 \text{ lb/day (30 day)}
 \end{aligned}$$

$$\begin{aligned}
 \text{ROG(R2)} &= (0.045 \text{ lb}/1000 \text{ gal})(63,000,000 \text{ gal}/\text{mo})(12)(1/365) \\
 &= 93.21 \text{ lb/day (two racks)} \\
 &= 46.6 \text{ lb/day (each rack)} \\
 &= 1.94 \text{ lb/hr (each rack)} \\
 &= 17,010 \text{ lb/yr (each rack)}
 \end{aligned}$$

$$\begin{aligned}
 \text{ROG(R1)} &= (1.97)/(1-0.99) \\
 &= 197 \text{ lb/hr (assuming 99\% DRE of VRU)}
 \end{aligned}$$

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT ENGINEERING AND COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES 14	PAGE 9
	APPL NO 482011-3,495826 509013,524810	DATE 10-1-13
	PROCESSED BY LLD	CHECKED BY

Emissions of ROG are part of the rack permit emissions and are accounted in rack applications A/N's 482012-3.

Note NSR program reflects in order to reflect the 95 lb/day (30-day avg):

A/N 482012 47 lb/day (30 day)

A/N 482013 48 lb/day (30 day)

Recent Source Tests results are summarized in Attached Table (SFPP Orange VRU Test Results):

VRU Emissions Summary:

Pollutant	Lb/hr (corrected)	Lb/day (corrected)	Lb/day (old)	
NOx	4.28	102.8	134	
CO	12.6	302.4	36	
SOx	0.037	1	1	
PM=PM10	0.33	8	8	
ROG *	1.97	47.25	47 or 48	

* ROG emissions here are entered for each rack and are carried over from previous rack applications.

GHG Emissions: Assume gasoline emission factors from Tables C-1 and C-2 of CFR98

Gasoline -63 mmbtu/hr VRU Pollutants	General Combustion GHG EF <lb/mmbtu>	Emissions < lb/hr>
CO2	154.81	9753.03
CH4	0.0030	0.19
N2O	0.0006	0.038

CO2e = 42,678.3 tpy

Source Test Requirement:

Source test frequency will be changed from annually to every 60 calendar months. Historical test results showing compliance with emission limits, along with an approved CMS plan, will ensure continual compliance with all emission limits.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT ENGINEERING AND COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES 14	PAGE 10
	APPL NO 482011-3,495826 509013,524810	DATE 10-1-13
	PROCESSED BY LLD	CHECKED BY

EVALUATION:

Rules:

- 401: No visible emissions are expected.
- 402: No nuisance is expected with proper operational procedures and mitigation measures.
- 462: This is a Class A facility. The emissions from the loading racks are controlled through a vapor recovery system/afterburner which reduces VOC emissions to 0.08 lb/1000 gallons. Permit conditions currently limit the emissions to 0.045 lb/1000 gallons. Source tests during the last four years show compliance with the 0.045 limit. Continued compliance is expected.

Reg 13:

Racks: There is no increase in thruput so there is no emission increase from the racks due to this change of conditions. Previous emissions will be carried over.

Vapor Recovery/Afterburner: There is no emission increase from the rating correction. NOx and CO emission factors are based on max heat rating. Since there is no increase in max rating, there is no increase in NOX and CO emissions.

1303(a)(1) BACT: This afterburner is BACT/LAER for the loading racks.

1303(b)(1&2) Offsets and Modeling: This control equipment is exempt from modeling and offsets per 1304(a)(5) Air Pollution Control Strategies

1303(b)(4) Facility compliance: There have been no NOV's or NC's during the last three years.

1303(b)(5)(A&D) Compliance Thru CEQA: This project is exempt per the responses on the 400 CEQA form

- 1401: There is no risk increase from this project since there was no increase in VOC emissions.

40 CFR 60 Subpart XX: These loading racks are subject to this regulation and will comply with the emission limit of 35 mg/L.

Title V: This permit will be issued as a revision (DeMinimus Significant) to the existing Title V Permit (under A/N 459635) after a 45-day EPA review period.

This project will meet all District Rules and Regulations. It is recommended that Permits to Operate be granted subject to the attached conditions.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT ENGINEERING AND COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES 14	PAGE 11
	APPL NO 482011-3,495826 509013,524810	DATE 10-1-13
	PROCESSED BY LLD	CHECKED BY

A/N 511411: Storage Tank OR-6

This application was submitted 6/2/10 as an Admin Change to A/N 444804:F77349 to correct typos in tank size and dimension.

When A/N 444804 : F77349 was issued a permit in 2005 (Admin seal change to A/N 205841:D13414), the tank size was incorrectly listed as 24,000 bbl instead of 20,000 bbl and the tank height was listed as 48 ft instead of 40 ft. A/N 205841 does indeed describe the tank as 20,000 bbl and 40 ft. high.

This application will correct these typos back to 20,000 bbl and 40 ft high.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT ENGINEERING AND COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES 14	PAGE 12
	APPL NO 482011-3,495826 509013,524810	DATE 10-1-13
	PROCESSED BY LLD	CHECKED BY

A/N 524810: Waste Oil/Water Separation System

INTRODUCTION:

This application was submitted 6/30/11 as a Class III to increase the thruput from 3000 gal/yr to 1,620,000 gal/yr. An earlier application (A/N 509013) was submitted 3/18/10 to replace a waste water evaporation pond with a new double-walled holding tank. During the processing of the tank replacement, a thruput limit of 3000 gal/yr was proposed based on historical information and calculations in a previous application (A/N 181405:P/O D11294). KMLT wanted to increase this thruput and submitted this newer application to cover the increase. SFPP Orange at 800129 has no available ROG ERCs, so the proposed thruput was amended to 745,000 gal/yr such that the emission increase would not require offsets (see email dated May 20, 2013 from Paul Liao-Yorke Engineering)

The earlier application (A/N 509013) will be cancelled and the new tank will be included in this permit.

PROCESS DESCRIPTION:

This application is a modification to A/N 181405:P/O D11294 to replace the waste water evaporation tank with a new water holding tank to comply with CCR Title 22, Sections 66265.192 and 66265.193 and to increase wastewater thruput from 3000 gal/yr to 745,000 gal/yr. New tank has double-wall construction and secondary containment. Water in this new tank is treated thru a liquid-phase carbon vessel prior to discharge to the sewer system (POTW). POTW discharge permit allows up to 25000 gpd (email from Y. Wang 4/4/11), but KMLT is requesting a thruput of 2041 gpd.

CALCULATIONS:

Oil Water Separator : From "AP-42, Section 5.1 Table 5.1-2 Fugitive Emissions Factors for Petroleum Refineries (1/95)- EF = 0.2 lb VOC/1000 gal wastewater (oil/water separators – controlled emissions)

$$\begin{aligned}
 \text{PostMod VOC } R1=R2 &= 0.2 \text{ lb/1000 gal wastewater} * 745,000 \text{ gal/yr} \\
 &= 149.0 \text{ lb/yr} \\
 *1/12 &= 12.4 \text{ lb/mo} \\
 *1/360 &= 0.41 \text{ lb/day (30-day avg)} \\
 *1/365 &= 0.41 \text{ lb/day} \\
 *1/24 &= 0.017 \text{ lb/hr}
 \end{aligned}$$

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT ENGINEERING AND COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES 14	PAGE 13
	APPL NO 482011-3,495826 509013,524810	DATE 10-1-13
	PROCESSED BY LLD	CHECKED BY

PreMod VOC R1=R2 = 0.2 lb/1000 gal wastewater * 3000 gal/yr
 = 0.6 lb/yr
 *1/360 = 0.002 lb/day (30-day avg)
 *1/365 = 0.00164 lb/day
 *1/24 = 0.00007 lb/hr

HEALTH RISK ASSESSMENT:

Assume annual ROG emissions are 324 lb/yr (conservative). Assume a conservative gasoline TAC profile, the speciated emissions are:

TAC Emissions

TAC	Wt.% in Vapor	Emissions, lbs/yr	Emissions, lb/hr
Benzene	2.80	9.07	0.00104
Ethyl benzene	0.10	0.324	0.00004
n-Hexane	4.13	13.38	0.00153
Toluene	1.46	4.73	0.00054
Xylenes	0.51	1.65	0.00019
Naphthalene	0.0014	0.00454	5.17E-7
Methanol	1.60	5.184	0.00059
Hydrogen fluoride	1.00	3.24	0.00037
Hydrogen sulfide	1.00	3.24	0.00037
Styrene	0.16	0.518	0.00006
Butadiene	0.11	0.356	0.00004
Cresol	0.0013	0.00421	4.81E-7
Phenol	0.0015	0.00486	5.55E-7

In accordance with the procedures prescribed in the District's Risk Assessment Procedures for Rules 1401 and 212, a Tier 2 analysis was performed (see Excel Spreadsheet Tier 2 Risk Assessment).

Assume: Volume Source
 Residential = 914 m

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT ENGINEERING AND COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES 14	PAGE 14
	APPL NO 482011-3,495826 509013,524810	DATE 10-1-13
	PROCESSED BY LLD	CHECKED BY

Commercial = 61 m

Dimensions: Area =216 ft2 (estimated "footprint" of O-W separator)

The results indicate that the MICR for the residential receptor is 1.553E-08 and for the worker is 3.14E-07. Thus, the MICR is less one in one million and each chronic and acute index is also well below the threshold limit of 1.0.

EVALUATION:

Rules:

- 401: No visible emissions are expected.
- 402: No nuisance is expected with proper operational procedures and mitigation measures.

- 464: This system collects and treats oily waters from tank cleaning, spills, bottom draining, etc. The sump and o-w separator are covered. Compliance.

- Reg 13:BACT: ROG emissions are less than one pound per day. BACT is not triggered
Modeling: Modeling for ROG is not required.
Offsets: ROG emissions increase is 0.41 lb/day. No offsets are required

- 1303(b)(4) Facility compliance: There have been no NOV's or NC's during the last three years.

- 1303(b)(5)(A&D) Compliance Thru CEQA: This project is exempt per the responses on the 400 CEQA form

- 1401: The risk associated with this throughput increase is less than one in a million and HIA and HIC are less than one.

Title V: This permit will be issued as a revision (DeMinimus Significant) to the existing Title V Permit (under A/N 495826) after a 45-day EPA review period.

CONCLUSION:

This project will meet all District Rules and Regulations. It is recommended that a Permit to Operate be granted subject to the attached conditions.