

<b>SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT</b>  <b>ENGINEERING AND COMPLIANCE DIVISION</b>  <b>PERMIT APPLICATION EVALUATION AND CALCULATIONS</b>	PAGES 13	PAGE 1
	APPL NO 530376, 79,92, 532703-4	DATE 3-12-12
	PROCESSED BY LLD	CHECKED BY

**OWNER/OPERATOR:**

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YORKE ENGINEERING

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**APPLICATIONS IN THIS BATCH (TV DeMinimus Significant Revision A/N 530402)**

A/N 530376	Tank C-9 (P/C-P/O)
A/N 530379	Tank C-11 (P/C-P/O)
A/N 530392	Rack No. 2 (P/C-P/O)
A/N 532703	Tank C-4 (P/C)
A/N 532704	Tank C-5 (Cancel)

(see draft permit(s))

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**INTRODUCTION:**

These applications were submitted 12/15/11 for a biodiesel project to add the capacity to store and load/unload biodiesel at the facility. Additional applications for C-4 and C-5 were also submitted 2/24/12 to add nozzles to existing tanks.

A commodity change will add “biodiesel” to seven existing tanks, a modification along with commodity change is needed to add heaters/recirculation system to two existing tanks, modification is needed to rack no. 2 to add two UNLOADING arms for biodiesel stock, and a change of conditions to all the remaining racks will allow loading of biodiesel.

This biodiesel project will be split into two phases. Due to the construction scheduling, SFPP requested that Tanks 9 and 11 and Rack 2 be processed first so that they may be able to start construction on the unloading arms and the heaters. The remaining tanks and rack will be processed later in the second phase since only a commodity change and/or throughput change will be needed.

Additionally, new nozzles for Tanks C-4 and C-5 (previously permitted under 334998:R-F10908 and 481223:G5701, respectively) will be added and these two tanks will be included in this TV revision. A/N 532704 for Tank C-5 will be cancelled since the addition of the nozzle was already permitted under A/N 481223).

SFPP Colton functions as bulk loading/unloading and pipeline transfer station. It delivers petroleum products via loading racks and pipelines to customers in the southeast California region. The company receives petroleum products from three in-bound pipelines from its Watson station that is part of the pipeline distribution network from Los Angeles refineries.

There is one NOV issued for vapor leaks from Rack 7 that occurred 8/12/11. The NOV was closed 2/14/12.

There are no schools within 1000 feet of this facility.

**PROCESS DESCRIPTION:**

B100 is a biodiesel blendstock. MSDS show it is 99.9% soy methyl ester and 0.1% #2 diesel fuel with a vapor pressure of <2 mmHg (<0.039 psia). KMLT submitted a lab analysis of the biodiesel stock showing vapor pressure at 20 deg C averaging 0.000008 mmHg (1.55E-7 psia). This vapor pressure is much lower than diesel, which is about 0.009 psia at 70 deg F.

B100 will be trucked in and unloaded in Rack No. 2 and stored in Tanks C-9 and C-11.

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Rack No. 2 will be modified to add two 4" bottom unloading arms. In addition, an accumulator, pump, and strainer system will be installed. Vapors will be vented back to the trucks.

Tanks C-9 and C-11 will be modified by adding an electrical heater (glycol/water) with a shell and tube heat exchanger and product recirculation pump to each tank. B100 product will be maintained at 70 deg F.

From there, B100 is blended with Ultra Low Sulfur Diesel to make B5 biodiesel. B100 is injected into the incoming pipeline manifolds to create B5 at a ratio of 95% Ultra Low Sulfur Diesel (ULSD) and 5% B100. B5 will be stored in Tanks C-1, C-2, C-21, C-22, C-4, C-42, C-8. Applications have already been submitted to allow the addition of biodiesel in these tanks and will be processed as phase 2 of this project.

All the existing diesel loading racks/arms will load biodiesel.

Application No. <i>(previous A/N)</i>	Equipment	Permitted Commodity	Proposed Commodity	Modification
530376 <i>(194584)</i> <i>Pre-NSR/R219</i>	Tank C-9 (Fixed Roof)	Diesel	Diesel and Add biodiesel blend stock, biodiesel, jet kerosene	Add heater with heat exchanger, recirculation system, insulation, nozzle  Add thruput of 60 turn/yr = 3,279,360 gal/mo = 78,080 bbl/mo
530379 <i>(427126)</i>	Tank C-11 (DEFR)	TVP < 11 psia	Multi +diesel, biodiesel blend stock, biodiesel	Add heater with heat exchanger, recirculation system, insulation, nozzle  Add thruput of 75 turn/yr
530392 <i>(474549)</i>	Rack No. 2	Petroleum products	Add biodiesel, etc	Add two unloading arms, two 30 HP pumps, and accumulator for the offloading line
532703 <i>(334998)</i>	Tank C-4	TVP < 11 psia		Replace existing inlet and outlet nozzles, add another inlet nozzle

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532704  (481223)	Tank C-5	Denatured Ethanol	Denatured Ethanol	Cancel. Addition of nozzle was covered under A/N 481223
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**CALCULATIONS:**

Since Tank C-9 is a Pre-NSR equipment (was never subject to Reg 13), the previous 24 months thrupt data was used to determine a PreMod baseline (per 1306(d)(2) and 1306(c)(1)). Info submitted by Paul Liao of Yorke Engineering in an email dated 3/7/12 show the following:

Year 1 (2010) : Annual thrupt = 778,760 bbl/yr = 32,707,920 gal/yr = 49.87 turn/yr  
Year 2 (2011) : Annual thrupt = 915,764 bbl/yr = 38,462,088 gal/yr = 58.64 turn/yr

Using TANKS 4.0.9d, the daily emissions were determined for each year. Note that daily emissions were determined both for BACT baseline (annual/365) and offsets baseline (max month/30). Daily emissions in both scenarios were averaged.

	BACT <lb/day>	Offsets <lb/day> (30-day avg)
Year 1 2010 PreMod	1.82	2.12
Year 2 (2011)	1.86	2.21
<b>Average</b>	<b>1.86</b>	<b>2.17</b>

**TANK C-9**

Appl. No. Tank ID	Prev. A/Ns	PreMod	PostMod
530376  Tank C-9	194584 (R219)  Pre NSR	Fixed Roof  TVP = 0.009 psia Diesel	Fixed Roof Heated w/ recir system, insulated  RVP = TVP = 0.011 psia jet kerosene (diesel, biodiesel blend stock, biodiesel, jet kerosene)  Thruput = 102 turn/yr = 5,574,912 gal/mo
Emission from Tank Program		63.782 lb/mo (Aug)  1.86 lb/day (BACT)  2.17 lb/day (30-day) = 0.090 lb/hr  665.13 lb/yr (2010) 690.51 lb/yr (2011)	83.65123 lb/mo (aug)  2.75 lb/day (BACT)  2.79 lb/day (30-day) = 0.116 lb/hr  1003.81 lb/yr
Increase			+ <b>0.89 lb/day (BACT)</b> + <b>0.62 lb/day (Offsets)</b>

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**TANK C-11**

Appl. No. Tank ID	Prev. A/Ns	PreMod	PostMod
530379  Tank C-11	427126 (R1178 doming)  197102	Domed External Float Roof Cat A mech shoe primary Rim mounted sec seal  RVP = 13.5 psia (400E18 – 7/03) TVP = 11 psia  “organic liquid ≤ 11 psia” on permit  No thruput on permit  Thruput == 75 turns/yr gasoline (Tank summary A/N 197102)	Domed External Float Roof Cat A mech shoe primary Rim mounted sec seal Heated w/ recir system, insulated  RVP = 13.5 psia TVP = 11 psia (add petroleum distillates, diesel, biodiesel blend stock, biodiesel results in no emission increase)  Thruput = 75 turns/yr = 63,000,000 gal/yr = 5,250,000 gal/mo
Emission from Tank Program		113.74 lb/mo (Aug)  0.16 lb/hr 3.89 lb/day (30-day) 1227.86 lb/yr	113.74 lb/mo (Aug)  0.16 lb/hr 3.89 lb/day (30-day) 1227.86 lb/yr
Increase			<b>0</b>

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**BULK LOADING/UNLOADING RACK NO. 2**

Rack thruput does not change. New fugitives (from the unloading arms) are limited to 180 ppm. See Excel spreadsheet for fugitive calculations.

A/N	Rack ID	Thruput	PostMod thruput	Emissions
530392  <i>(prev. A/N 474549)</i>	No. 2	total: 3,325,903 bbl/mo  gas/transmix: 243,333 bbl/mo	3,325,903 bbl/mo  Gas/transmix: 243,333 bbl/mo	(EF = 0.02 lb/1000 gal)  180 ppm new components fugitive limits  7.0 lb/day (current NSR) 0.28 lb/hr
Fugitives			0.25 lb/day	0.25 lb/day
Total				7.25 lb/day 0.30 lb/hr
Increase				<b>+0.25 lb/day</b>

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**TANK C-4**

Appl. No. Tank ID	Prev. A/Ns	PreMod	PostMod
532703  Tank C-4	334998 (C/O)  214350 (doming/upgrade seal under Mobil P/C 1990 not R1178)  197102	Domed External Float Roof Primary seal Secondary seal  TVP = 11 psia (permit condition)  “petroleum liquid ≤ 11 psia” on permit  No thruput on permit  Thruput == 75 turns/yr gasoline (Tank summary A/N 334998)  Thruput = 35 turn/yr (A/N 214350 Tank summary, Engr Eval/calcs)	Domed External Float Roof Primary seal Secondary seal    RVP = 13.5 psia TVP = 11 psia
Emission from Tank Program			Emissions will be determined under A/N 530382 (phase 2 biodiesel)
Fugitives			<b>0.35 lb/day</b>
Increase			<b>+ 0.35</b>

Fugitive emissions from the addition of a nozzle are calculated based on 2 valves, 12 flanges, and 12 connectors (per email from Yijin Wang dated 3/7/12). This is an “overestimate” to be conservative. Fugitives are 0.35 lb/day (see Excel Spreadsheet)

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**TANK C-5**

This application will be cancelled since the nozzle was already approved under A/N 481223.

Total emission **increase** from this phase of the project:

	lb/day
Tank C-9	0.62
Tank C-11	0
Rack 2	0.25
Tank C-4	0.35
<b>Total</b>	<b>1.22</b>

ERCs for project = 1.22 \* 1.2 = 1.46 lb/day or **1 pound ERC**

**HEALTH RISK ASSESSMENT:**

**Annual increase of emissions Tank C-9 is : ROG = 1003.8 – 665.13 = 338.67 lb/yr.** To be conservative, the total emissions from C-9 and the vapor speciation of gasoline will be used. There is no increase in emissions from C-11, so there is no increase in health risk. **The increase of emission from rack 2 is from the new fugitive components at 0.25 lb/day = 91.25 lb/yr. The increase of emissions from Tank C-4 from the new fugitives at 0.35 lb/day = 127.75 lb/yr. The fugitives from Rack2 and C-4 will be added together for a total of 219 lb/yr (instead of separately) to determine risk in order to be more conservative.**

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TAC Emissions Increase from Storage Tank C-9 (+338.67 lb/yr)

TAC	Wt.% in Vapor	Emissions, lbs/yr	Emissions, lb/hr
Benzene	2.80	9.48	0.00108
Ethyl benzene	0.10	0.339	0.00004
n-Hexane	4.13	13.99	0.0016
Toluene	1.46	4.94	0.00056
Xylenes	0.51	1.727	0.0002
Naphthalene	0.0014	0.00474	5.41E-7
Methanol	1.60	5.42	0.00062
Hydrogen fluoride	1.00	3.387	0.00039
Hydrogen sulfide	1.00	3.387	0.00039
Styrene	0.16	0.542	0.00006
Butadiene	0.11	0.373	0.00004
Cresol	0.0013	0.0044	5.03E-7
Phenol	0.0015	0.0051	5.80E-7

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

Assume: Point Source (fixed roof tank)  
Residential/school = 366 m = 1200 ft (From SFPP Map)  
Commercial = 71 m = 250 ft (from SFPP Map)  
Tank Dimensions: H = 48 ft.

The results indicate that the MICR for the residential receptor is 1.6E-07 and for the worker is 3.18E-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.

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TAC Emissions Increase from Rack No. 2 and C-4 (+219 lb/yr)

TAC	Wt.% in Vapor	Emissions, lbs/yr	Emissions, lb/hr
Benzene	2.80	6.13	0.0007
Ethyl benzene	0.10	0.219	0.00003
n-Hexane	4.13	9.045	0.00103
Toluene	1.46	3.197	0.00037
Xylenes	0.51	1.12	0.00013
Naphthalene	0.0014	0.00307	3.5E-7
Methanol	1.60	3.5	0.0004
Hydrogen fluoride	1.00	2.19	0.00025
Hydrogen sulfide	1.00	2.19	0.00025
Styrene	0.16	0.35	0.00004
Butadiene	0.11	0.24	0.00003
Cresol	0.0013	0.00285	3.25E-7
Phenol	0.0015	0.00329	3.75E-7

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

Assume:       Volume (assume 2 unloading arms with height about 6 ft and area about 100 sq. ft))  
Residential/school = 366 m = 1200 ft (From SFPP Map)  
Commercial = 71 m = 250 ft (from SFPP Map)

The results indicate that the MICR for the residential receptor is 1.12E-07 and for the worker is 3.57E-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.

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**Total Risk**

	Residential	Commercial
Tank C-9	1.6E-7	3.18E-7
Rack 2 and Tank C-4	1.12E-7	3.57E-7
<b>Total</b>	<b>2.72E-7</b>	<b>6.75E-7</b>
	<b>PASS</b>	<b>PASS</b>

**RULES:**

212: Public notice is not required.

402: Nuisance is not expected.

462: The rack is required to meet a limit of 0.02 lb/1000 gal which is less than required the 0.08 lb/1000 gal loaded per this rule. Compliance expected.

463: The fixed roof tank C-9 stores organic liquid with a vapor pressure of less than 0.5 psia so it is exempt from venting to vapor recovery. The external floating roof tanks C-11 and C-4, with its seals, complies with this rule and all other applicable parts of this rule.

1178: The external floating roof tank C-11 was “domed” in 2004 and complies with all applicable requirements of this rule. C-4 was domed in 1990 prior to adoption of R1178.

Reg 13: Emission increases from Tank C-9 is less than one pound per day so BACT is not required. There are no increases from Tank C-11. There is less than one pound per day increase each from Rack 2 and C-4 so BACT is not required. The total increase from this phase of the project is 1.22 pound per day, so offsets in the form of ERC’s are required. SFPP Colton has ERCs for this facility available to be used.

1401: Health risk from the emissions increase from this project using Tier 2 shows that risk is less than one in a million. Compliance expected.

Reg XXX: This will be issued as a DeMinimus Revision to the existing TV facility under A/N 530402. A 45-day EPA review period is needed prior to permit issuance.

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**CONCLUSION and RECOMMENDATION**

This project will comply with all applicable rules and regulations. Permits to Construct/Operate and /or Permits to Construct are recommended after 45-day EPA comment period.