10.0 Attachments

10.1 Emission Calculation Documentation

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10.1 EMISSION CALCULATION DOCUMENTATION

This attachment contains all relevant emission calculation documentation used for the emission tables in Section 5. Refer to Section 4 for the general equations. The letters A through E below refer to Tables 5.1-1 and 5.1-2.

Reference A – Internal Combustion Engines

- The maximum operating schedule is in units of hours.
- The default fuel HHV is 1,050 Btu/scf.
- Emission factors (lb/MMBtu) are based on HHV.
- For conversion from ppmv to lb/MMBtu see section 10.2 calculations
- NO_x
  - ☞EF = 0.46 lb/MMBtu (lean-burn ICE);
  - ☞EF = 0.324 lb/MMBtu (rich burn ICEs), this EF is not based on the 50 ppmv exhaust concentration limit, it was established by the ERC agreement and is based on 90% reduction of uncontrolled emissions.
- CO
  - ☞EF = 10.125 lb/MMBtu (lean burn ICE);
  - ☞EF = 3.825 lb/MMBtu (rich burn ICEs)
- ROC
  - ☞EF = 2.495 lb/MMBtu (lean burn ICE);
  - ☞EF = 0.321 lb/MMBtu (rich burn ICEs)
- PM_{10}
  - ☞EF = 0.048 lb/MMBtu (lean burn ICE) USEPA AP-42 [Table 3.2-1 (7/00)];
  - ☞EF = 0.014 lb/MMBtu (rich burn ICEs) USEPA AP-42 [Table 3.2-3 (7/00)]
- SO_x
  - ☞ SO_x (as SO_2) = [0.169] × [ppmvd S ÷ (HHV of fuel]
  - ☞EF = 0.0129 lb/MMBtu
- Q (fuel use/time period) = (BSFC) * (bhp) * (hours/time period) / (HHV in Btu/scf)
- H (heat input / hour) = (Rated bhp) * (BSFC)

Eqpt.ID #	Plant ID#	IC Engine Description	Rated bhp	BSFC	MMBtu/hr Input
1199	# 2	I-R LVG-82; SN 8AL126	650	11,231	7.30
1200	# 3	I-R LVG-82; SN 8AL129	650	11,231	7.30
1201	# 4	I-R LVG-82; SN 8AL128	650	11,231	7.30
1202	# 5	I-R LVG 82; SN 8AL127	650	11,231	7.30
1203	# 6	I-R KVG-62; SN 6EL265	660	11,061	7.30
1204	# 7	I-R KVG-62; SN 6EL266	660	11,061	7.30
1205	# 8	I-R KVG-62; SN 6EL267	660	11,061	7.30
1206	# 9	Cooper-Bessemer GMV-10C	1100	9,109	10.02

HAP Emission Factors:
Hazardous air pollutant (HAP) emission factors for the IC engines are obtained from USEPA, Appendix A of the background report for Section 3.2 of AP-42. The database of source test results contained in appendix A can be downloaded from http://www.epa.gov/ttn/chief/ap42/ch03/related/c03s02.html. For MU 2-8, the average of all source test results in the database for each species for NSCR-controlled, four-cycle, rich-burn, IC engines at 90% load or greater was used as the emission factor. For MU 9, the average of all source test results for two stroke lean burn IC engines at 90% load or greater was used. For acrolein only source test reports based on FTIR were considered. The background report for Section 3.2 states that the EPA has identified possible interference problems with quantifying aldehyde emissions using CARB method 430 and recommends basing emission factors on FTIR measurements. For acetaldehyde and formaldehyde the source test results were non-detect, for these pollutants the emissions factors in this permit were based on the detection level of the source tests.

These emission factors are updated from permit reevaluation 9584-R2, which used emission factors from AP-42, Section 3.2 (January 1995).

Reference B – 'C-60' Micro-turbines

- The maximum operating schedule is in units of hours.
- The default fuel HHV is 1,050 Btu/scf.
- Emission factors units (lb/MMBtu) are based on HHV.
- For conversion from lb/MW-hr to lb/MMBtu, *see section 10.2 calculations*
- NO_x
  - ☞EF = 0.5 lb/MW-hr
  - ☞EF = 0.0373 lb/MMBtu
- ROC
  - ☞EF = 1 lb/MW-hr
  - ☞EF = 0.0746 lb/MMBtu

- CO
  - ☞EF = 6 lb/MW-hr
  - ☞EF = 0.4478 lb/MMBtu

- PM_{10} emission factors, based on CA: DG-02 guidelines, are 0.0066 lb/MMBtu

- SO_x emissions based on mass balance:
  - ☞ SO_x (as SO_2) = [0.169] × [ppmvd S ÷ (HHV of fuel]
  - ☞EF = 0.0129 lb/MMBtu

- Q (fuel use/time period) = 12.8 scf/min

- H (MMBtu/hour) = Q (scf/min) * 60 (min/hour) * 1050 (Btu/scf) / 1,000,000

HAP Emission Factors:
Hazardous air pollutant (HAP) emission factors for the micro-turbines are obtained from USEPA, AP-42 Table 3.1-3 (April 2000). These factors are listed in Table 5.4-2A of this permit.

Reference C1 - Flares

☞ The maximum operating schedule is in units of hours

☞ The flare gas properties are:

⇒ HHV = 985 Btu/scf (estimated)

⇒ Fuel S = 80 ppmv (as total sulfur) for flare pilots and 239 ppmvd for flare gas

☞ The flare emission factors are based on Rule 359 limits for NO_x, ROC and CO

☞ SO_x emissions based on mass balance:
  - ☞ SO_x (as SO_2) = [0.169] × [ppmvd S ÷ (HHV of fuel]
  - ☞EF = 0.041 lb/MMBtu

HAP Emission Factors:
Hazardous air pollutant (HAP) weight fractions for the flare emissions are obtained from *CARB Speciation Manual (2nd Edition, 9/91), Profile Number 79 (Flares – Chemical Manufacturing).* The speciation does not list methane or ethane, so the speciation does not need to be corrected from weight percent TOG to weight percent ROC.

Reference C2 – Hot Oil Heaters

☞ The maximum operating schedule is in units of hours

☞ The emission factors for NO_x, CO, ROC, PM and PM_{10} are based on AP-42 emission factors for small natural gas-fired boilers (Tables 1.4-1 and 1.4-2 dated July 1998).

☞ SO_2 emission limits (factors) are based on the combustion of PUC natural gas.

HAP Emission Factors:
Hazardous air pollutant (HAP) emission factors for the hot oil heater emissions are obtained from AP-42 for small natural gas-fired boilers (Tables 1.4-3 dated July 1998).

Reference D – HC condensate Storage Tanks

- The maximum operating schedule is in units of hours;
- The hourly/daily/annual emissions scenario is based on the following assumptions:

- Hydrocarbon Condensate Tank:
  1. Maximum True vapor pressure: 5.5 psia @ 70°F
  2. API Gravity = 39
  3. Emissions occur 24 hours/day and 365 days/year.
  4. The annually-averaged HC throughput rate is 8.154 barrels/day corresponding to the annual throughput of 125,000 gallons/year

- Flotation Cells:
  1. Maximum True vapor pressure: 5.5 psia @ 70°F
  2. API Gravity = 39
  3. Emissions occur 24 hours/day and 365 days/year.
  4. The combined HC and brine water 'annual average' throughput rate is 48.924 barrels/day, corresponding to an annual throughput of 750,000 gallons for the entire facility.

- Emission factors are based on the *USEPA's AP-42, Section 7* guidelines.

  HAP Emission Factors:
  Hazardous air pollutant (HAP) weight fractions for the HC condensate storage tank emissions are obtained from the *CARB Speciation Manual (2nd Edition, 9/91), Profile Number 297(Crude Oil Evaporation).* The weight fractions contained in the speciation manual are for total organic gases, therefore the weight fractions have been corrected to exclude methane and ethane. An example for benzene is given below:

  $\text{ROC fraction}_{benzene} = \text{TOG fraction}_{benzene} / (1 - \text{TOG fraction}_{methane} - \text{TOG fraction}_{ethane})$
  $\text{ROC fraction}_{benzene} = 0.0240 /(1-0.0880-0.0270) = 0.0240 / 0.8850 = 0.0271$

Reference E -- Loading Station

- The maximum operating schedule is in units of hours;
- The daily/annual emissions scenario is computed, based on the following assumptions:
  1. The liquid condensate loading rate occurs at a maximum rate of 7,140 gallons/hour, and 20,000 gallons/day (2.8 hours of operation) and 125,000 gal/year (17.51 hours of operation). The hourly loading rate and daily and annual hours of operation are not permit limits, they are just used to calculate daily and annual mass emissions.
  2. The loading at the NGL station is uncontrolled.
  3. The emission factors are derived from USEPA's AP-42, Chapter 5.2 (*Transportation and Marketing of Petroleum Liquids*) guidelines

$$L_L = 12.46 \frac{SPM}{T} \quad (1)$$

where:

L_L = loading loss, pounds per 1000 gallons (lb/10^3 gal) of liquid loaded

S = a saturation factor (see Table 5.2-1)
P = true vapor pressure of liquid loaded, pounds per square inch absolute (psia) (see Figure 7.1-5, Figure 7.1-6, and Table 7.1-2)
M = molecular weight of vapors, pounds per pound-mole (lb/lb-mole) (see Table 7.1-2)
T = temperature of bulk liquid loaded, °R (°F + 460)

S = 0.60 (submerged loading, dedicated normal service)
P = 5.5 psia
M = 37 lb/lb-mol
T = 530 deg R

Loading loss THC emissions are then corrected to ROC using an ROC/THC ratio of 0.960.

HAP Emission Factors:
Hazardous air pollutant (HAP) weight fractions for the HC loading station emissions are obtained from the *CARB Speciation Manual (2nd Edition, 9/91), Profile Number 756(Oil & Gas Production Fugitives – Liquid Service).* The weight fractions contained in the speciation manual are for total organic gases, therefore the weight fractions have been corrected to exclude methane and ethane. An example for benzene is given below:

ROC $\text{fraction}_{benzene}$ = TOG $\text{fraction}_{benzene}$ / (1 – TOG $\text{fraction}_{methane}$ – TOG fraction_{ethane})
ROC $\text{fraction}_{benzene}$ = 0.0010 /(1-0.0640-0.3760) = 0.0010 / 0.5600 = 0.0018

Reference F - Gas Venting from Wells

- The maximum operating schedule is in units of hours.

- All venting emissions are credited with zero percent emission control efficiency, since the venting operation is not subjected to any ROC emissions control.

- The specific volume of the PUC quality natural gas vented is 19.59 scf/lb. (9/14/99 data).

- Thus, each million standard cubic foot (MMscf) of gas vented at the facility weighs 10^6/19.59 = 51046.45 lbs.

- Field data (9/14/99) show the ROC mass fraction in the facility natural gas to be 13.3 percent.

- The ROC emission factor of the natural gas vented at the SoCalGas facility is, therefore, 51046.45 lbs.*0.133 = 6789 lb/MMscf..

HAP Emission Factors:
Hazardous air pollutant (HAP) emission factors for hexane are based on monthly gas composition analyses performed by SoCalGas for their PUC quality gas as well as the gas stored in their wells. Twenty-four data points were taken from the analytical results obtained during 2001 – 2002; these yielded a mean value of 0.05 for the 'hexane plus' fraction in the ROC. These analytical results were not reported as individual compounds, just as all compounds with the molecular weight of hexane or higher. Therefore the hexane emission factor listed in the tables is very conservative. The emission factor for benzene is based on the ROC content of the emissions, as speciated in *CARB Speciation Manual (2nd Edition, 9/91), Profile Number 757 (Oil & Gas Production Fugitives – Gas Service).* The weight fraction for benzene contained in the speciation manual is a fraction of total organic gases, therefore the weight fraction has been corrected to exclude methane and ethane.

$\text{ROC fraction}_{benzene} = \text{TOG fraction}_{benzene} / (1 - \text{TOG fraction}_{methane} - \text{TOG fraction}_{ethane})$
$\text{ROC fraction}_{benzene} = 0.0010 /(1-0.6130-0.0790) = 0.0010 / 0.3080 = 0.0032$

PTO 9584 R2 contained a column in the HAP tables for iso-octane (2,2,4 trimethylpentane). Iso-octane is a product of petroleum refining, since this facility receives and handles PUC quality natural gas, and the dehydration and separation processes at the facility do not include any refining, iso-octane is not expected in the gas handled at the facility.

SoCalGas has conducted sampling showing that iso-octane levels in the gas are non-detect. SoCalGas will continue to conduct sampling during 2009 to confirm the absence of iso-octane. This sampling may also be used to further refine the emission factors for the other species.

Reference G - Fugitive Components

- The maximum operating schedule is in units of hours.
- All fugitive emission components are credited with zero percent emission control efficiency, since none of the equipment is subject to any fugitive emissions I&M program.
- The component leak path definition differs from the APCD Rule 331 definition of a component. A typical leak path count for a valve could be equal to 4 (one valve stem, a bonnet connection and two flanges).
- Leak path counts are provided by applicant and verified by facility inspections.
- Emission factors based on the SBCAPCD *P&P Document 6100.061.1996.* Production Field emission factors from Table 2 are used, but the ROC/THC ratio is 0.133, based on facility-specific data.
- Sample calculation spreadsheets are attached.

HAP Emission Factors:
Hazardous air pollutant (HAP) emission factors for hexane are based on monthly gas composition analyses performed by SoCalGas for their PUC quality gas as well as the gas stored in their wells. Twenty-four data points were taken from the analytical results obtained during 2001 – 2002; these yielded a mean value of 0.05 for the 'hexane plus' fraction in the ROC. These analytical results were not reported as individual compounds, just as all compounds with the

molecular weight of hexane or higher. Therefore the hexane emission factor listed in the tables is very conservative. The emission factor for benzene is based on the ROC content of the emissions, as speciated in *CARB Speciation Manual (2nd Edition, 9/91), Profile Number 757 (Oil & Gas Production Fugitives – Gas Service)*. The weight fraction for benzene contained in the speciation manual is a fraction of total organic gases, therefore the weight fraction has been corrected to exclude methane and ethane.

$\text{ROC fraction}_{benzene} = \text{TOG fraction}_{benzene} / (1 - \text{TOG fraction}_{methane} - \text{TOG fraction}_{ethane})$
$\text{ROC fraction}_{benzene} = 0.0010 /(1-0.6130-0.0790) = 0.0010 / 0.3080 = 0.0032$

PTO 9584 R2 contained a column in the HAP tables for iso-octane (2,2,4 trimethylpentane). Iso-octane is a product of petroleum refining, since this facility receives and handles PUC quality natural gas, and the dehydration and separation processes at the facility do not include any refining, iso-octane is not expected in the gas handled at the facility.

SoCalGas has conducted sampling showing that iso-octane levels in the gas are non-detect. SoCalGas will continue to conduct sampling during 2009 to confirm the absence of iso-octane. This sampling may also be used to further refine the emission factors for the other species.

Reference H - Solvents

- All solvents not used to thin surface coatings are included in this equipment category.
- Quarterly and annual ROC emission rates are based on estimated maximum solvent use (*see below*).
- Hourly emission limits are not provided; the facility operates 'JRI Model TL-21' parts washing unit using non-ROC solvents.'
- ROC emissions are estimated as: 2.20 lb/day and 0.4 ton/year; this is based on the estimated 'wipe cleaning' use of about 200 gallons of solvents per year containing about 800 lb of ROC.
- No APCD-approved solvent reclamation program operates at the facility.

HAP Emission Factors:
Hazardous air pollutant (HAP) emissions were not computed for 'solvent' emissions since a large number of solvents are used at the Plant, each solvent with a different HAP composition. Also, total ROC emissions from the solvents used do not exceed 0.4 ton *annually*; thus, the HAP fraction of the emissions are estimated to be below 0.05 tons on a conservative basis.

Reference I: Internal Combustion Engines – *APCD permit-exempt, Gas-fired engines*

- The maximum operating schedule is in units of hours.
- The default fuel (PUC quality natural gas) characteristics are:

  - density = 0.0459lb/scf
  - LHV = 950 Btu/scf
  - HHV = 1,050 Btu/scf

- Emission factors units (lb/MMBtu) are based on HHV.

- LCF (conversion of LHV to HHV) values are not required to be used for fuel listed.

- *NO_x and ROC emission factors are consistent with those established for gas-fired, uncontrolled IC engines* — pursuant to a 1991 field study and agreed to by the APCD and the oil & gas industry in Santa Barbara, namely:

  - <u>NO_x</u>
    ☞ $EF_{lb/MMBtu}$ = 1.905 (rich-burn ICE's: SCC # 20200202) ;

  - <u>ROC</u>
    ☞ $EF_{lb/MMBtu}$ = 0.103 (rich-burn ICE's : SCC # 20200202)

  - CO emission factors are consistent with AP-42 , Section 3.2 Tables
  - For conversion from lb/MMscf to lb/MMBtu, used AP-42 (2/97) listed fuel HHV of 1019.4 Btu/scf
  - <u>CO</u>
    ☞ $EF_{lb/MMBtu}$ = 1.6 (rich-burn ICE's; SCC # 20200253) ;

  - PM_{10} emission factors based on USEPA AP-42;
  - For rich-burn engines = 0.01275 lb/MMBtu [Table 3.2-4 (2/97)];
  - SO_x emissions based on mass balance:
    ☞ SO_x (as SO_2) = [0.169] × [ppmvd S ÷ (HHV of fuel]

<u>HAP Emission Factors</u>:

Hazardous air pollutant (HAP) emission factors for the gas-fired, uncontrolled, four-cycle, rich-burn, IC engines are obtained from USEPA, AP-42 (*Air-Chief as supplemented by FIRE, Version 9.0, October, 2001).*

10.2 Calculation Spreadsheets

Combustion Equipment Emissions Calculations
ICE Emission Factor Derivation -- Conversion from ppmv to lb/MMBtu

ppmv to lb/MMBTU:

@ 15% exhaust oxygen (dry basis) & standard conditions (1.0 atm., 60 °F)

lb_i/MMBTU = $ppmv_i$ (SCF_i/$MMSCF_{exhaust}$) * (F, $SCF_{exhaust}$/MMBTU) * (MW_i, lb_i/lb-mole) / (379 SCF_i/lb-mole) / (10^6/MM) / (XSA)

Acronym Description and Reference:

F	=	fuel expansion factor @ 0% excess exhaust oxygen, dry basis and 60 °F = 8608 scf/MMBtu (SBCAPCD ICE Technical Reference Document).
MW	=	Average molecular weight of exhaust pollutant specie(s), lb_i/lb-mole
XSA	=	Excess air correction factor from O% to 15% exhaust oxygen {dimensionless constant = [20.9-15.0]/[20.9-0.0] = 0.282}.

Average Exhaust Pollutant Molecular Weights:

		lb_i/lb-mole
1.	NO_x as NO_2:	46
2.	CO	28
3.	ROC	41.31

The ROC molecular weight is an assumed average molecular weight for the non-methane, non-ethane organic compounds in the engine exhausts.

Combustion Equipment Emissions Calculations

Supplemental Information for Micro-turbines

TABLE 10.2 - EMISSION FACTOR DERIVATION FROM ARB DG-002

C60 Microturbines - PUC Quality Natural Gas

DATA:

Parameter	*Symbol*	*Value*	*Units*	*Reference*
Power Output	kW	60	kW	Permit application
Heat Rate (LHV based)	HRL	12,182	Btu/kWh	Permit application
Fuel Correction Factor	FCF	1.1	dimensionaless	Permit application
Heat Rate (HHV based)	HRH	13,400	Btu/kWh	Manufacturer Specifications
F-Factor (F_D)	FD	8,608	(dscf/MMBtu)	SBCAPCD ICE Tech Ref Doc
Molar Volume of Gasses	mv	379	(scf/lb-mole)	Attach. 5-5 USEPA Combustion Manual
Stack NOx (as NO2)	ppmvN	0.5	lb/MW-hr	Executive Order DG-002
Stack ROC (as CH4)	ppmvR	1	lb/MW-hr	Executive Order DG-002
Stack CO	ppmvC	6	lb/MW-hr	Executive Order DG-002
Molec Weight NOx	MWN	46	lb/lbmole	NOx as NO2
Molec Weight ROC	MWR	16	lb/lbmole	ROC as methane
Molec Weight CO	MWC	28	lb/lbmole	

CALCULATIONS:

Parameter	*Symbol*	*Value*	*Units*	*Calculation*
Hourly Heat Input	QH	0.804	MMBtu/hr	QH = (kW*HRH)/10^6
Stack Flow (0% O2)	S1	6,921	dscf/hr	S1 = FD * QH
Stack Flow (15% O2):	S2	24,516	dscf/hr	S2 = S1 * {(20.9-0)/(20.9-15)}
NOx Mass Emissions	EN	0.030	lb/hr	EN = {(ppmvN/10^6)*S2*MWN/mv}
ROC Mass Emissions	ER	0.060	lb/hr	ER = {(ppmvR/10^6)*S2*MWR/mv}
CO Mass Emissions	EC	0.360	lb/hr	EC = {(ppmvC/10^6)*S2*MWC/mv}
NOx Emission Factor	EFNOX	0.0373	lb/MMBtu	EFNOX = EN/QH
ROC Emission Factor	EFROC	0.0746	lb/MMBtu	EFROC = ER/QH
CO Emission Factor	EFCO	0.4478	lb/MMBtu	EFCO = EC/QH
Stack NOx (as NO2)	ppmvN	10	ppmv	ppmvN = {(EN*{mv/MWN}*(10^6/S2)}
Stack ROC (as CH4)	ppmvR	58	ppmv	ppmvR = {(ER*{mv/MWR}*(10^6/S2)}
Stack CO	ppmvC	199	ppmv	ppmvC = {(EC*{mv/MWC}*(10^6/S2)}

FIXED ROOF TANK CALCULATION (AP-42: Chapter 7 Method)

Basic Input Data	
liquid (1:G13, 2:G10, 3:G7, 4:C, 5:JP, 6:ker, 7:O2, 8:O6) =	4
liquid TVP =	5.5
if TVP is entered, enter TVP temperature (°F) =	70
tank heated (yes, no) =	no
if tank is heated, enter temp (°F) =	
vapor recovery system present? (yes, no) =	yes
is this a wash tank? (yes, no) =	no
will flashing losses occur in this tank? (yes, no) =	no
breather vent pressure setting range (psi) (def = 0.06):	0.06

Attachment:	10.2
Permit:	ATC/PTO10980
Date:	01/27/09
Tank:	Flotation-1
Name:	SoCalGas
Filename:	...\flot-tank1-calc.xls
District:	Santa Barbara
Version:	Tank-2c.xls

PRINT

Tank Data		
diameter (feet) =		12
capacity (enter barrels in first col, gals will compute) =	238	10,000
conical or dome roof? (c, d) =		c
shell height (feet) =		12
roof height (def = 1):		1
ave liq height (feet):		6
color (1:Spec Al, 2:Diff Al, 3:Lite, 4:Med, 5:Rd, 6:Wh) =		4
condition (1: Good, 2: Poor) =		1

ATC' PROPOSED EMISSIONS

Liquid Data	A	B
maximum daily throughput (bopd) =		49
Ann thruput (gal): (enter value in Column A if not max PTE)		7.500E+05
RVP (psia):		7.0119
°API gravity =		39

Paint Factor Matrix	paint condition	
paint color	good	poor
spec alum	0.39	0.49
diff alum	0.60	0.68
lite grey	0.54	0.63
med grey	0.68	0.74
red	0.89	0.91
white	0.17	0.34

Molecular Weight Matrix	
liquid	mol wt
gas rvp 13	62
gas rvp 10	66
gas rvp 7	68
crude oil	50
JP-4	80
jet kerosene	130
fuel oil 2	130
fuel oil 6	190

Computed Values		
roof outage [1] (feet):		0.3
vapor space volume [2] (cubic feet):		713
turnovers [3]:		75
turnover factor [4]:		0.57
paint factor [5]:		0.68
surface temperatures (°R, °F)		
average [6]:	527.2	67.2
maximum [7]:	539	79
minimum [8]:	515.4	55.4
product factor [9]:		0.75
diurnal vapor ranges		
temperature [10] (fahrenheit degrees):		47.2
vapor pressure [11] (psia):		2.175608
molecular weight [12] (lb/lb-mol):		50
TVP [13] (psia) [adjusted for ave liquid surface temp]:		5.23685
vapor density [14] (lb/cubic foot):		0.046283
vapor expansion factor [15]:		0.313
vapor saturation factor [16]:		0.363824
vented vapor volume (scf/bbl):		13.3
fraction ROG - flashing losses:		0.308
fraction ROG - evaporative losses:		0.885

Adjusted TVP Matrix	
liquid	TVP value
gas rvp 13	7.908
gas rvp 10	5.56
gas rvp 7	3.932
crude oil	5.23685
JP-4	1.516
jet kerosene	0.0103
fuel oil 2	0.009488
fuel oil 6	0.0000472

RVP Matrix	
liquid	RVP value
gas rvp 13	13
gas rvp 10	10
gas rvp 7	7
crude oil	7.011897
JP-4	2.7
jet kerosene	0.029
fuel oil 2	0.022
fuel oil 6	0.00019

Long-Term
VRU_Eff = 95.00%

Short-Term
VRU_Eff = 95.00%

Emissions	Uncontrolled ROC emissions			Controlled ROC emissions		
	lb/hr	lb/day	ton/year	lb/hr	lb/day	ton/year
breathing loss [17] =	0.14	3.33	0.61	0.01	0.17	0.03
working loss [18] =	0.20	4.85	0.88	0.01	0.24	0.04
flashing loss [19] =	0.00	0.00	0.00	0.00	0.00	0.00
TOTALS =	0.34	8.17	1.49	0.02	0.41	0.07

FIXED ROOF TANK CALCULATION (AP-42: Chapter 7 Method)

Basic Input Data	
liquid [1:G13, 2:G10, 3:G7, 4:C, 5:JP, 6:ker, 7:O2, 8:O6] =	4
liquid TVP =	5.5
if TVP is entered, enter TVP temperature (°F) =	70
tank heated [yes, no] =	no
if tank is heated, enter temp (°F) =	
vapor recovery system present? [yes, no] =	yes
is this a wash tank? [yes, no] =	no
will flashing losses occur in this tank? [yes, no] =	no
breather vent pressure setting range (psi) (def = 0.06):	0.06

Attachment:	10.2
Permit:	ATC/PTO 10980
Date:	01/27/09
Tank:	HC storage tank
Name:	SoCalGas
Filename:	..\HC-tank-calc.xls
District:	Santa Barbara
Version:	Tank-2c.xls

PRINT

Tank Data		
diameter (feet) =		10
capacity (enter barrels in first col, gals will compute) =	168	7,050
conical or dome roof? [c, d] =		c
shell height (feet) =		12
roof height (def = 1):		1
ave liq height (feet):		6
color [1:Spec Al, 2:Diff Al, 3:Lite, 4:Med, 5:Rd, 6:Wh] =		4
condition [1: Good, 2: Poor] =		1

ATC' PROPOSED EMISSIONS

Liquid Data	A	B
maximum daily throughput (bopd) =		8
Ann thruput (gal): (enter value in Column A if not max PTE)		1.250E+05
RVP (psia):		7.0119
°API gravity =		39

Paint Factor Matrix	paint condition	
paint color	good	poor
spec alum	0.39	0.49
diff alum	0.60	0.68
lite grey	0.54	0.63
med grey	0.68	0.74
red	0.89	0.91
white	0.17	0.34

Molecular Weight Matrix	
liquid	mol wt
gas rvp 13	62
gas rvp 10	66
gas rvp 7	68
crude oil	50
JP-4	80
jet kerosene	130
fuel oil 2	130
fuel oil 6	190

Computed Values		
roof outage [1] (feet):		0.3
vapor space volume [2] (cubic feet):		495
turnovers [3]:		17.73
turnover factor [4]:		1
paint factor [5]:		0.68
surface temperatures (°R, °F)		
average [6]:	527.2	67.2
maximum [7]:	539	79
minimum [8]:	515.4	55.4
product factor [9]:		0.75
diurnal vapor ranges		
temperature [10] (fahrenheit degrees):		47.2
vapor pressure [11] (psia):		2.175608
molecular weight [12] (lb/lb-mol):		50
TVP [13] (psia) [adjusted for ave liquid surface temp]:		5.23685
vapor density [14] (lb/cubic foot):		0.046283
vapor expansion factor [15]:		0.313
vapor saturation factor [16]:		0.363824
vented vapor volume (scf/bbl):		13.3
fraction ROG - flashing losses:		0.308
fraction ROG - evaporative losses:		0.885

Adjusted TVP Matrix	
liquid	TVP value
gas rvp 13	7.908
gas rvp 10	5.56
gas rvp 7	3.932
crude oil	5.23685
JP-4	1.516
jet kerosene	0.0103
fuel oil 2	0.009488
fuel oil 6	0.0000472

RVP Matrix	
liquid	RVP value
gas rvp 13	13
gas rvp 10	10
gas rvp 7	7
crude oil	7.011897
JP-4	2.7
jet kerosene	0.029
fuel oil 2	0.022
fuel oil 6	0.00019

Long-Term
VRU_Eff = 95.00%

Short-Term
VRU_Eff = 95.00%

Emissions	Uncontrolled ROC emissions			Controlled ROC emissions		
	lb/hr	lb/day	ton/year	lb/hr	lb/day	ton/year
breathing loss [17] =	0.10	2.31	0.42	0.00	0.12	0.02
working loss [18] =	0.06	1.42	0.26	0.00	0.07	0.01
flashing loss [19] =	0.00	0.00	0.00	0.00	0.00	0.00
TOTALS =	0.16	3.73	0.68	0.01	0.19	0.03

10.3 Fee Calculations

Emission fees for the La Goleta facility are based on APCD Rule 210, Section I.B.1, Schedule A (July, 2008). Since the last permit was issued in June 2006 and this PTO is being issued in June 2009, no pro-rating of the fees are necessary. The fee Table is shown next.

FEE STATEMENT
PT-70/Reeval No. 09584 - R3
FID: 01734 La Goleta / SSID: 05019

Santa Barbara County
Air Pollution Control District

Device Fee

Device No.	Device Name	Fee Schedule	Qty of Fee Units	Fee per Unit	Fee Units	Max or Min. Fee Apply?	Number of Same Devices	Pro Rate Factor	Device Fee	Penalty Fee?	Fee Credit	Total Fee per Device
001199	IC Engine: Gas Compressor # 2	A3	7.300	396.55	Per 1 million Btu input	No	1	1.000	2,894.82	0.00	0.00	2,894.82
001200	IC Engine: Gas Compressor # 3	A3	7.300	396.55	Per 1 million Btu input	No	1	1.000	2,894.82	0.00	0.00	2,894.82
001201	IC Engine: Gas Compressor # 4	A3	7.300	396.55	Per 1 million Btu input	No	1	1.000	2,894.82	0.00	0.00	2,894.82
001202	IC Engine: Gas Compressor # 5	A3	7.300	396.55	Per 1 million Btu input	No	1	1.000	2,894.82	0.00	0.00	2,894.82
001203	IC Engine: Gas Compressor # 6	A3	7.300	396.55	Per 1 million Btu input	No	1	1.000	2,894.82	0.00	0.00	2,894.82
001204	IC Engine: Gas Compressor # 7	A3	7.300	396.55	Per 1 million Btu input	No	1	1.000	2,894.82	0.00	0.00	2,894.82
001205	IC Engine: Gas Compressor # 8	A3	7.300	396.55	Per 1 million Btu input	No	1	1.000	2,894.82	0.00	0.00	2,894.82
001206	IC Engine: Gas Compressor # 9	A3	10.020	396.55	Per 1 million Btu input	No	1	1.000	3,973.43	0.00	0.00	3,973.43
107543	Micro-turbine Generator, Unit 1	A3	0.800	396.55	Per 1 million Btu input	No	1	1.000	317.24	0.00	0.00	317.24
107544	Micro-turbine Generator, Unit 2	A3	0.800	396.55	Per 1 million Btu input	No	1	1.000	317.24	0.00	0.00	317.24
107545	Micro-turbine Generator, Unit 3	A3	0.800	396.55	Per 1 million Btu input	No	1	1.000	317.24	0.00	0.00	317.24
107546	Micro-turbine Generator, Unit 4	A3	0.800	396.55	Per 1 million Btu input	No	1	1.000	317.24	0.00	0.00	317.24
008666	E/S Diesel Firewater Pump # 12A	A3	0.930	396.55	Per 1 million Btu input	No	1	1.000	368.79	0.00	0.00	368.79
008668	E/S Diesel Firewater Pump # 13A	A3	0.930	396.55	Per 1 million Btu input	No	1	1.000	368.79	0.00	0.00	368.79
001215	Flare #3 (Tank Farm)	A3	1.600	396.55	Per 1 million Btu input	No	1	1.000	634.48	0.00	0.00	634.48
001212	Flare #2 (Plant #14)	A3	1.600	396.55	Per 1 million Btu input	No	1	1.000	634.48	0.00	0.00	634.48
001211	Flare #1 (Plant #14)	A3	1.600	396.55	Per 1 million Btu input	No	1	1.000	634.48	0.00	0.00	634.48

Device No.	Device Name	Fee Schedule	Qty of Fee Units	Fee per Unit	Fee Units	Max or Min. Fee Apply?	Number of Same Devices	Pro Rate Factor	Device Fee	Penalty Fee?	Fee Credit	Total Fee per Device
104915	Sulfides Scrubber Units	A1.a	1.000	52.86	Item	No	1	1.000	52.86	0.00	0.00	52.86
104916	Reduced Sulfur Scrubber Unit	A1.a	1.000	52.86	Item	No	1	1.000	52.86	0.00	0.00	52.86
107706	Reduced Sulfur Scrubber Unit	A1.a	1.000	52.86	Item	No	1	1.000	52.86	0.00	0.00	52.86
001214	Hot Oil Heater #1	A3	4.000	396.55	Per 1 million Btu input	No	1	1.000	1,586.20	0.00	0.00	1,586.20
107535	Hot Oil Heater #2	A3	2.200	396.55	Per 1 million Btu input	No	1	1.000	872.41	0.00	0.00	872.41
001219	Flotation Cell #1	A6	10.000	3.03	Per 1000 gallons	Min	1	1.000	52.52	0.00	0.00	52.52
001220	Flotation Cell #2	A6	10.000	3.03	Per 1000 gallons	Min	1	1.000	52.52	0.00	0.00	52.52
001217	Liquid Hydrocarbon Storage Tank	A6	7.050	3.03	Per 1000 gallons	Min	1	1.000	52.52	0.00	0.00	52.52
001218	Brine Water Storage Tank	A6	40.600	3.03	Per 1000 gallons	No	1	1.000	123.02	0.00	0.00	123.02
100899	Methanol Storage Tank	A6	0.500	3.03	Per 1000 gallons	Min	1	1.000	52.52	0.00	0.00	52.52
100901	Odorant Storage Tank	A6	1.000	3.03	Per 1000 gallons	Min	1	1.000	52.52	0.00	0.00	52.52
100873	Gas/Glycol Contactors	A6	1.000	3.03	Per 1000 gallons	Min	3	1.000	157.56	0.00	0.00	157.56
100874	Gas/Glycol Contactor	A6	1.000	3.03	Per 1000 gallons	Min	1	1.000	52.52	0.00	0.00	52.52
100877	Glycol Particulate Filters	A1.a	1.000	52.86	Item	No	2	1.000	105.72	0.00	0.00	105.72
100878	Glycol/Gas Separator	A6	1.000	3.03	Per 1000 gallons	Min	1	1.000	52.52	0.00	0.00	52.52
100889	Glycol Rectifier	A1.a	1.000	52.86	Item	No	1	1.000	52.86	0.00	0.00	52.86
100892	Electric Motors Driving Glycol Rectifier Pumps	A2	7.500	27.40	per rated hp	No	2	1.000	411.00	0.00	0.00	411.00
100893	Electric Motors Driving Glycol Pumps	A2	20.000	27.40	per rated hp	No	3	1.000	1,644.00	0.00	0.00	1,644.00
100875	Vapor Condensing Coils	A1.a	1.000	52.86	Item	No	1	1.000	52.86	0.00	0.00	52.86
100879	High Pressure Separator	A1.a	1.000	52.86	Item	No	1	1.000	52.86	0.00	0.00	52.86
100880	Sand Trap	A1.a	1.000	52.86	Item	No	1	1.000	52.86	0.00	0.00	52.86
100881	Low Pressure Separator	A1.a	1.000	52.86	Item	No	1	1.000	52.86	0.00	0.00	52.86
100887	Condensate Surge Tank	A6	1.000	3.03	Per 1000 gallons	Min	1	1.000	52.52	0.00	0.00	52.52
100888	Horizontal Separator	A6	1.000	3.03	Per 1000 gallons	Min	1	1.000	52.52	0.00	0.00	52.52
100894	Vapor Condensing Coils	A1.a	1.000	52.86	Item	No	1	1.000	52.86	0.00	0.00	52.86
100895	High Pressure Separator	A1.a	1.000	52.86	Item	No	1	1.000	52.86	0.00	0.00	52.86
100896	Low Pressure Separator	A1.a	1.000	52.86	Item	No	1	1.000	52.86	0.00	0.00	52.86

Device No.	Device Name	Fee Schedule	Qty of Fee Units	Fee per Unit	Fee Units	Max or Min. Fee Apply?	Number of Same Devices	Pro Rate Factor	Device Fee	Penalty Fee?	Fee Credit	Total Fee per Device
100866	Cooling Motor Fan in Heat Exchanger	A2	40.000	27.40	per rated hp	No	1	1.000	1,096.00	0.00	0.00	1,096.00
100867	Cooling Motor Fan in Heat Exchanger	A2	40.000	27.40	per rated hp	No	1	1.000	1,096.00	0.00	0.00	1,096.00
100865	Cooling Motor Fan in Heat Exchanger	A2	40.000	27.40	per rated hp	No	1	1.000	1,096.00	0.00	0.00	1,096.00
100868	Oil Heater Circulation Pump Motors	A2	40.000	27.40	per rated hp	No	1	1.000	1,096.00	0.00	0.00	1,096.00
100869	Glycol Unit Condenser Fan Motor	A2	6.000	27.40	per rated hp	No	1	1.000	164.40	0.00	0.00	164.40
100870	Glycol Unit Condenser Fan Motor	A2	5.000	27.40	per rated hp	No	1	1.000	137.00	0.00	0.00	137.00
100871	Condensate Pumps	A2	1.500	27.40	per rated hp	Min	1	1.000	52.52	0.00	0.00	52.52
100872	Oil Heater Blower Fan	A2	7.500	27.40	per rated hp	No	1	1.000	205.50	0.00	0.00	205.50
107541	Oil Heater Blower Fan, New	A2	1.000	27.40	per rated hp	Min	1	1.000	52.52	0.00	0.00	52.52
008670	Underground Gas Storage Wells	A1.a	1.000	52.86	Item	No	21	1.000	1,110.06	0.00	0.00	1,110.06
100876	Accumulator Stack	A1.a	1.000	52.86	Item	No	2	1.000	105.72	0.00	0.00	105.72
100897	Blower	A2	1.500	27.40	per rated hp	Min	1	1.000	52.52	0.00	0.00	52.52
008669	Grade Level Loading Station	A1.a	1.000	52.86	Item	No	1	1.000	52.86	0.00	0.00	52.86
100903	Gas Stacks/Vents	A1.a	1.000	52.86	Item	No	1	1.000	52.86	0.00	0.00	52.86
100898	Condensate Pump	A2	5.000	27.40	per rated hp	No	1	1.000	137.00	0.00	0.00	137.00
100900	Pneumatic Pumps	A1.a	1.000	52.86	Item	No	2	1.000	105.72	0.00	0.00	105.72
100902	Odorant Metering Pump	A1.a	1.000	52.86	Item	No	1	1.000	52.86	0.00	0.00	52.86
100904	Vent Stack Sump Pump	A1.a	1.000	52.86	Item	No	1	1.000	52.86	0.00	0.00	52.86
	Device Fee Sub-Totals =								**$40,819.57**	**$0.00**	**$0.00**	
	Device Fee Total =											**$40,819.57**

Permit Fee

Fee Based on Devices **40,819.57**

Fee Statement Grand Total = $40,819

Notes:
(1) Fee Schedule Items are listed in APCD Rule 210, Fee Schedule "A".
(2) The term "Units" refers to the unit of measure defined in the Fee Schedule.

10.4 IDS Database Emission Tables

Table 10.4-1
Permitted Potential to Emit (PPTE)

	NO_X	ROC	CO	SO_X	TSP	PM_{10}
Part 70/APCD PTO 9584-R2 – La Goleta Plant						
lb/day	551.73	1655.80	7160.39	27.95	30.35	30.35
tons/year	97.76	292.07	1,306.14	5.08	5.35	5.35

Table 10.4-2
Facility Potential to Emit (FPTE)

	NO_X	ROC	CO	SO_X	TSP	PM_{10}
Part 70/APCD PTO 9584-R2 – La Goleta Plant						
lb/day	551.73	1655.80	7160.39	27.95	30.35	30.35
tons/year	97.76	292.07	1,306.14	5.08	5.35	5.35

Table 10.4-3
Facility 'Federal" Potential to Emit

	NO_X	ROC	CO	SO_X	TSP	PM_{10}
Part 70/APCD PTO 9584-R2 – La Goleta Plant						
lb/day	597.45	1,114.56	7,199.58	28.28	30.66	30.66
tons/year	107.05	193.34	1,313.57	5.14	5.42	5.42

Table 10.4-4
Facility Net Emission Increase Since 1990 (FNEI-90)

	NO_X	ROC	CO	SO_X	TSP	PM_{10}
Part 70/APCD PTO 9584-R22 – La Goleta Plant						
lb/day	1.77	1.80	0.00	1.03	0.30	0.30
tons/year	0.33	0.42	0.00	0.19	0.05	0.05

10.5 Equipment List

[PT-70/Reeval 09584 R3 / FID: 01734 La Goleta / SSID: 05019]

1 IC Engines with Controlled Emissions

1.1 IC Engine: Gas Compressor # 2

Device Number: 001199 Operator ID Number: Gas Compressor # 2
Number of Devices: 1
Manufacturer: Ingersoll-Rand Make: Model: LVG-82, Serial No: 8AL126
Rated Heat Input: BSFC: 11231.00 BTU/bhp-hr Parameter Size: 650.00 Horsepower
Device Description:

1.2 IC Engine: Gas Compressor # 3

Device Number: 001200 Operator ID Number: Gas Compressor # 3
Number of Devices: 1
Manufacturer: Ingersoll-Rand Make: Model: LVG-82 Serial No: 8AL129
Rated Heat Input: BSFC: 11231.00 BTU/bhp-hr Parameter Size: 650.00 Horsepower
Device Description:

1.3 IC Engine: Gas Compressor # 4

Device Number: 001201 Operator ID Number: Gas Compressor # 4
Number of Devices: 1
Manufacturer: Ingersoll-Rand Make: Model: LVG-82 Serial No: 8AL128
Rated Heat Input: BSFC: 11231.00 BTU/bhp-hr Parameter Size: 650.00 Horsepower
Device Description:

1.4 IC Engine: Gas Compressor # 5

Device Number: 001202 Operator ID Number: Gas Compressor # 5
Number of Devices: 1
Manufacturer: Ingersoll-Rand Make: Model: LVG-82 Serial No: 8AL127
Rated Heat Input: BSFC: 11231.00 BTU/bhp-hr Parameter Size: 650.00 Horsepower
Device Description:

1.59 IC Engine: Gas Compressor # 6

Device Number: 001203 Operator ID Number: Gas Compressor # 6
Number of Devices: 1
Manufacturer: Ingersoll-Rand Make: Model: KVG-62 Serial No: 6EL265
Rated Heat Input: BSFC: 11061.00 BTU/bhp-hr Parameter Size: 660.00 Horsepower
Device Description:

1.610 IC Engine: Gas Compressor # 7

Device Number: 001204 Operator ID Number: Gas Compressor # 7
Number of Devices: 1
Manufacturer: Ingersoll-Rand Make: Model: KVG-62 Serial No: 6EL266
Rated Heat Input: BSFC: 11061.00 BTU/bhp-hr Parameter Size: 660.00 Horsepower
Device Description:

1.711 IC Engine: Gas Compressor # 8

Device Number: 001205 Operator ID Number: Gas Compressor # 8
Number of Devices: 1
Manufacturer: Ingersoll-Rand Make: Model: KVG-62 Serial No: 6EL267
Rated Heat Input: BSFC: 11061.00 BTU/bhp-hr Parameter Size: 660.00 Horsepower

Device Description:

1.8 Catalytic Converter # 2

Device Number: 110814 Operator ID Number: # 2
Number of Devices: 1
Manufacturer: DCL International Make: Model: DC74 Serial No:
Rated Heat Input: BSFC: Parameter Size:
Device Description:

1.9 Catalytic Converter # 3

Device Number: 110815 Operator ID Number: # 3
Number of Devices: 1
Manufacturer: DCL International Make: Model: DC74 Serial No:
Rated Heat Input: BSFC: Parameter Size:
Device Description:

1.10 Catalytic Converter # 4

Device Number: 110816 Operator ID Number: # 4
Number of Devices: 1
Manufacturer: DCL International Make: Model: DC74 Serial No:
Rated Heat Input: BSFC: Parameter Size:
Device Description:

1.11 Catalytic Converter # 5

Device Number: 110817 Operator ID Number: # 5
Number of Devices: 1
Manufacturer: DCL International Make: Model: DC74 Serial No:
Rated Heat Input: BSFC: Parameter Size:
Device Description:

1.12 Catalytic Converter # 6

Device Number: 110818 Operator ID Number: # 6
Number of Devices: 1
Manufacturer: DCL International Make: Model: DC74 Serial No:
Rated Heat Input: BSFC: Parameter Size:
Device Description:

1.13 Catalytic Converter # 7

Device Number: 110819 Operator ID Number: # 7
Number of Devices: 1
Manufacturer: DCL International Make: Model: DC74 Serial No:
Rated Heat Input: BSFC: Parameter Size:
Device Description:

1.14 Catalytic Converter # 8

Device Number: 110820 Operator ID Number: # 8
Number of Devices: 1
Manufacturer: DCL International Make: Model: DC74 Serial No:
Rated Heat Input: BSFC: Parameter Size:
Device Description:

1.15 IC Engine: Gas Compressor # 9

Device Number: 001206 Operator ID Number: Gas Compressor # 9
Number of Devices: 1
Manufacturer: Cooper-Bessemer Make: Model: GMV-10C Serial No:
Rated Heat Input: BSFC: 9109.00 BTU/bhp-hr Parameter Size: 1100.00 Horsepower
Device Description:

1.16 Micro-turbine Generator, Unit 1

Device Number: 107543 Operator ID Number: #1
Number of Devices: 1
Manufacturer: CapstoneMake: Model: C-60 Serial No:
Parameter Size:
Device Description: NG-fired unit.

1.17 Micro-turbine Generator, Unit 2

Device Number: 107544 Operator ID Number: # 2
Number of Devices: 1
Manufacturer: CapstoneMake: Model: C-60 Serial No:
Parameter Size:
Device Description: NG-fired unit

1.18 Micro-turbine Generator, Unit 3

Device Number: 107545 Operator ID Number: # 3
Number of Devices: 1
Manufacturer: CapstoneMake: Model: C-60 Serial No:
Parameter Size:
Device Description: NG-fired unit

1.19 Micro-turbine Generator, Unit 4

Device Number: 107546 Operator ID Number: # 4
Number of Devices: 1
Manufacturer: CapstoneMake: Model: C-60 Serial No:
Parameter Size:
Device Description: NG-fired unit

1.20 E/S Diesel Firewater Pump # 12A

Device Number: 008666 Operator ID Number: # 12A
Number of Devices: 1
Manufacturer: Cummins Make: Model: V-378-F2 Serial No: 20195869
Rated Heat Input: BSFC: Parameter Size: 133.00 Brake Horsepower
Device Description: Operated < 200 hours/year; also included in Part 70 Insignificant Activities.

1.21 E/S Diesel Firewater Pump # 13A

Device Number: 008668 Operator ID Number: # 13A
Number of Devices: 1
Manufacturer: Cummins Make: Model: V-378-F2 Serial No: 20195868
Rated Heat Input: BSFC: Parameter Size: 133.00 Brake Horsepower
Device Description: Operated < 200 hours/year; also included in Part 70 Insignificant Activities.

2 IC Engines with Uncontrolled Emissions

3 Flares

3.1 Flare #3 (Tank Farm)

Device Number: 001215 Operator ID Number: #3
Number of Devices: 1
Manufacturer: Make: Model: Serial No:
Rated Heat Input: 1.60 MMBtu/Hour BSFC: Parameter Size:
Device Description: 1.6 MMBtu/hr capacity; pilot w/ natural gas.

3.2 Flare #2 (Plant #14)

Device Number: 001212 Operator ID Number: #2
Number of Devices: 1
Manufacturer: Make: Model: Serial No:
Rated Heat Input: 1.60 MMBtu/Hour BSFC: Parameter Size:
Device Description: Flare, 1.6 MMBtu/hr capacity; pilot w/ natural gas.

3.3 Flare #1 (Plant #14)

Device Number: 001211 Operator ID Number: #1
Number of Devices: 1
Manufacturer: Make: Model: Serial No:
Rated Heat Input: 1.60 MMBtu/Hour BSFC: Parameter Size:
Device Description: 1.6 MMBtu/hr capacity; pilot w/ natural gas.

3.4 Flare Gas Sulfur Removal Units

3.4.1 Sulfides Scrubber Units

Device Number: 104915 Operator ID Number:
Number of Devices: 1
Manufacturer: Cameron Make: Kleen Air Model: SULFATREAT Serial No:
Rated Heat Input: Parameter Size:
Device Description: Hydrogen Sulfide scrubber unit, 46" dia by 88" high, 4950 lbs. bed weight

3.4.2 Reduced Sulfur Scrubber Unit

Device Number: 104916 Operator ID Number:
Number of Devices: 1
Manufacturer: Cameron Make: Kleen Air Model: CEI-KMN Serial No:
Rated Heat Input: Parameter Size:
Device Description: TRS Removal Unit B, 46" dia by 64" high; bed size 2850 lbs.

3.4.3 Reduced sulfur scrubber unit

Device Number: 107706 Operator ID Number:
Number of Devices: 1
Manufacturer: Cameron Make: Kleen Air Model: CEI-KMN Serial No:
Parameter Size:
Device Description: TRS Removal Unit C, 46" dia by 64" high; bed size 2850 lbs.

4 External Combustion Units

4.1 Oil Heater

Device Number: 001214 Operator ID Number: HOH #1
Number of Devices: 1

Manufacturer: Fulton Thermal Corporation Make: Model: FT-0400C Serial No: 2788C
Rated Heat Input: 3.5 MMBtu/Hour BSFC: Parameter Size:
Device Description: Derated from 4.0 MMBtu/hr in 2000

4.2 Oil Heater

Device Number: 107535 Operator ID Number: HOH #2
Number of Devices: 1
Manufacturer: American Heater Company Make: Model: AHE-212-2P Serial No: 670-A04
Rated Heat Input: 2.2 MMBtu/Hour BSFC: Parameter Size:
Device Description: Operates only when HOH #1 is not operating.

5 Fixed Roof Tanks

5.1 Flotation Cell #1

Device Number: 001219 Operator ID Number:
Number of Devices: 1
Manufacturer: Make: Model: Serial No:
Parameter Size: 10000.00 Gallons
Device Description: 12' dia. by 12' height.

5.2 Flotation Cell #2

Device Number: 001220 Operator ID Number:
Number of Devices: 1
Manufacturer: Make: Model: Serial No:
Parameter Size: 10000.00 Gallons
Device Description: 12' dia. by 12' height.

5.3 Liquid Hydrocarbon Storage Tank

Device Number: 001217 Operator ID Number:
Number of Devices: 1
Manufacturer: Make: Model: Serial No:
Parameter Size: 7050.00 Gallons
Device Description: 10' dia. by 12' height.

5.4 Brine Water Storage Tank

Device Number: 001218 Operator ID Number:
Number of Devices: 1
Manufacturer: Make: Model: Serial No:
Parameter Size: 40600.00 Gallons
Device Description: 24' dia. by 12' height.

5.5 Methanol Storage Tank

Device Number: 100899 Operator ID Number:
Number of Devices: 1
Manufacturer: Make: Model: Serial No:
Parameter Size: 500.00 Gallons
Device Description: Pressurized with natural gas; with pressure relief valve.

5.6 Odorant Storage Tank

Device Number: 100901 Operator ID Number:
Number of Devices: 1
Manufacturer: Make: Model: Serial No:

Parameter Size: 1000.00 Gallons
Device Description: Relief valve set @ 33 psig, odorant -- Captan 50.

6 Fugitive Hydrocarbon Components - Gas/Light Liquid Service – CLP

6.1 Valves - Accessible

Device Number: 100882 Operator ID Number:
Number of Devices: 1
Manufacturer: Make: Model: Serial No:
Parameter Size: 2638.00 Component Leak path
Device Description:

6.2 Connections - Accessible

Device Number: 100883 Operator ID Number:
Number of Devices: 1
Manufacturer: Make: Model: Serial No:
Parameter Size: 18303.00 Component Leak path
Device Description:

6.3 Pressure Relief Devices - Uncontrolled

Device Number: 100886 Operator ID Number:
Number of Devices: 1
Manufacturer: Make: Model: Serial No:
Parameter Size: 89.00 Component Leak path
Device Description:

6.4 Compressor Seals - Accessible

Device Number: 100885 Operator ID Number:
Number of Devices: 1
Manufacturer: Make: Model: Serial No:
Parameter Size: 17.00 Component Leak path
Device Description:

6.5 Pump Seals - Accessible

Device Number: 100884 Operator ID Number:
Number of Devices: 1
Manufacturer: Make: Model: Serial No:
Parameter Size: 2.00 Component Leak path
Device Description:

7 Glycol Dehydration Unit

7.1 Gas/Glycol Contactors

Device Number: 100873 Operator ID Number:
Number of Devices: 3
Manufacturer: Braun & Lacy Make: Model: Serial No:
Parameter Size:
Device Description: Each 4.5' dia. by 37.8' long; with control tanks, three (3), each 16" dia. by 15.25' long .

7.2 Gas/Glycol Contactor

Device Number: 100874 Operator ID Number:

Number of Devices: 1
Manufacturer: Braun & Lacy Make: Model: Serial No:
Parameter Size:
Device Description: 4.5' dia. by 38.9' long; with a control tank 16" dia. by 17.67' long.

7.3 Glycol Particulate Filters
Device Number: 100877 Operator ID Number:
Number of Devices: 2
Manufacturer: Rol-Pak Make: Model: Serial No:
Parameter Size:
Device Description: Each 1.7' dia. by 4' tall.

7.4 Glycol/Gas Separator
Device Number: 100878 Operator ID Number:
Number of Devices: 1
Manufacturer: Southwest Welding Make: Model: Serial No:
Parameter Size:
Device Description: 4' dia. by 10.2' tall.

7.5 Glycol Rectifier
Device Number: 100889 Operator ID Number:
Number of Devices: 1
Manufacturer: Fisher-Klosterman Make: Model: Serial No:
Parameter Size:
Device Description: 18" diameter.

7.6 Electric Motors Driving Glycol Rectifier Pumps
Device Number: 100892 Operator ID Number:
Number of Devices: 2
Manufacturer: Make: Model: Serial No:
Parameter Size:
Device Description: Rated at 5.0 hp each.

7.7 Electric Motors Driving Glycol Pumps
Device Number: 100893 Operator ID Number:
Number of Devices: 3
Manufacturer: Make: Model: Serial No:
Parameter Size:
Device Description: Rated at 20 hp each.

8 Solvent Cleaning and Usage
8.1 Solvent Usage
Device Number: 008680 Operator ID Number:
Number of Devices: 1
Manufacturer: Make: Model: Serial No:
Parameter Size:
Device Description:

9 Separator Units in Processes
9.1 Vapor Condensing Coils
Device Number: 100875 Operator ID Number:
Number of Devices: 1

Manufacturer: Happy Co. Make: Model: Serial No:
Parameter Size:
Device Description: 4.0' wide by 18' long.

9.2 High Pressure Separator
Device Number: 100879 Operator ID Number:
Number of Devices: 1
Manufacturer: Make: Model: Serial No:
Parameter Size:
Device Description: V-100, welded construction, vertical, 3' dia. by 14.3' tall; connected to gas collection system.

9.3 Sand Trap
Device Number: 100880 Operator ID Number:
Number of Devices: 1
Manufacturer: Make: Model: Serial No:
Parameter Size:
Device Description: V-200, welded construction, horizontal, 3' dia. by 19.8' long; connected to gas collection system.

9.4 Low Pressure Separator
Device Number: 100881 Operator ID Number:
Number of Devices: 1
Manufacturer: Make: Model: Serial No:
Parameter Size:
Device Description: V-101, welded construction, vertical, 3' dia. by 14.3' tall; connected to gas collection system.

9.5 Condensate Surge Tank
Device Number: 100887 Operator ID Number:
Number of Devices: 1
Manufacturer: Make: Model: Serial No:
Parameter Size:
Device Description: 3' dia by 32' tall.

9.6 Horizontal Separator
Device Number: 100888 Operator ID Number:
Number of Devices: 1
Manufacturer: King Make: Model: Serial No:
Parameter Size: 900.00 Gallons
Device Description: With a separate bottom barrel.

9.7 Vapor Condensing Coils
Device Number: 100894 Operator ID Number:
Number of Devices: 1
Manufacturer: Air-X-Changer Make: Model: Serial No:
Rated Heat Input: Parameter Size:
Device Description: 0.67' wide by 7.3' long.

9.8 High Pressure Separator
Device Number: 100895 Operator ID Number:
Number of Devices: 1

Manufacturer: Make: Model: Serial No:
Parameter Size:
Device Description: V-100A, welded construction, vertical, 3' dia. by 14.3' tall; connected to gas collection system.

9.9 Low Pressure Separator
Device Number: 100896 Operator ID Number:
Number of Devices: 1
Manufacturer: Make: Model: Serial No:
Parameter Size:
Device Description: V-101A, welded construction, vertical, 3' dia. by 14.3' tall; connected to gas collection system.

10 Other Equipment Units (New) at Compressor Plant

10.1 Cooling Motor Fan in Heat Exchanger
Device Number: 100866 Operator ID Number: EMF-2
Number of Devices: 1
Manufacturer: Make: Model: Serial No:
Parameter Size:
Device Description: Powered by a 40 hp electric motor.

10.2 Cooling Motor Fan in Heat Exchanger
Device Number: 100867 Operator ID Number: EMF-3
Number of Devices: 1
Manufacturer: Make: Model: Serial No:
Parameter Size:
Device Description: Powered by a 40 hp electric motor.

10.3 Cooling Motor Fan in Heat Exchanger
Device Number: 100865 Operator ID Number: EMF-1
Number of Devices: 1
Manufacturer: Make: Model: Serial No:
Parameter Size:
Device Description: Powered by a 40 hp electric motor.

10.4 Oil Heater Circulation Pump Motors
Device Number: 100868 Operator ID Number: EMP-5 A/B
Number of Devices: 1
Manufacturer: Make: Model: Serial No:
Parameter Size:
Device Description: Powered by a 40 hp electric motor.

10.5 Glycol Unit Condenser Fan Motor
Device Number: 100869 Operator ID Number: EMF-4 A/B
Number of Devices: 1
Manufacturer: Make: Model: Serial No:
Parameter Size:
Device Description: Powered by a 6 hp electric motor.

10.6 Glycol Unit Condenser Fan Motor
Device Number: 100870 Operator ID Number: EMF-5

Number of Devices: 1
Manufacturer: Make: Model: Serial No:
Parameter Size:
Device Description: Powered by a 5 hp electric motor.

10.7 Condensate Pumps
Device Number: 100871 Operator ID Number: EMP-6 A/B
Number of Devices: 1
Manufacturer: Make: Model: Serial No:
Parameter Size:
Device Description: Powered by a 1.5 hp electric motor.

10.8 Oil Heater Blower Fan
Device Number: 100872 Operator ID Number: EMF-6
Number of Devices: 1
Manufacturer: Make: Model: Serial No:
Parameter Size:
Device Description: Powered by a 7.5 hp electric motor.

10.9 Oil Heater Blower Fan, New
Device Number: 107541 Operator ID Number: None
Number of Devices: 1
Manufacturer: Make: Model: Serial No:
Parameter Size: 1.00 Horsepower (Electric Motor)
Device Description: Additional blower fan at compressor plant for the oil heater

11 Equipment Units at 'Dehydration' Plant

11.1 Underground Gas Storage Wells
Device Number: 008670 Operator ID Number:
Number of Devices: 21
Manufacturer: Make: Model: Serial No:
Parameter Size:
Device Description:

11.2 Accumulator Stack
Device Number: 100876 Operator ID Number:
Number of Devices: 2
Manufacturer: Make: Model: Serial No:
Parameter Size:
Device Description: Closed.

11.3 Blower
Device Number: 100897 Operator ID Number:
Number of Devices: 1
Manufacturer: Make: Model: Serial No:
Parameter Size:
Device Description: For VRU at Tank Farm: electric motor, 1.75 hp.

11.4 Grade Level Loading Station
Device Number: 008669 Operator ID Number:
Number of Devices: 1

Manufacturer: Make: Model: Serial No:
Parameter Size:
Device Description: Grade level loading station to load HC condensate to tanker trucks by motor driven pump; not equipped with VRU.

11.5 Gas Stacks/Vents

Device Number: 100903 Operator ID Number:
Number of Devices: 1
Manufacturer: Make: Model: Serial No:
Parameter Size:
Device Description: For pipeline depressurizing operations.

12 Heat Exchangers

13 Pumps

13.1 Condensate Pump

Device Number: 100898 Operator ID Number:
Number of Devices: 1
Manufacturer: Make: Model: Serial No:
Parameter Size:
Device Description: Serving the storage tanks; 5 hp electric motor drive.

13.2 Pneumatic Pumps

Device Number: 100900 Operator ID Number:
Number of Devices: 2
Manufacturer: Make: Model: Serial No:
Parameter Size:
Device Description: Serving the methanol tank.

13.3 Odorant Metering Pump

Device Number: 100902 Operator ID Number:
Number of Devices: 1
Manufacturer: YZ Industries Make: Model: Model 8000 Serial No:
Parameter Size:
Device Description: Air actuated, w/positive displacement & reciprocating plunger.

13.4 Vent Stack Sump Pump

Device Number: 100904 Operator ID Number:
Number of Devices: 1
Manufacturer: Make: Model: Serial No:
Parameter Size:
Device Description: Pneumatic.

10.6 EXEMPT EQUIPMENT

1 **Air Conditioning System**
Device Number: 100916 Operator ID Number:
Number of Devices: 0
Manufacturer: Make: Model: Serial No:
Parameter Size:
Part-70 Insignificant: Yes
APCD Rule Exemption Basis: 202.L.2 Air Cond/Vent Systm W/No Air Contaminant Removal
Device Description: Also included in Part 70 Insignificant Activities.

2 **IC Engine: Air Compressor # 4A**
Device Number: 001221 Operator ID Number: Air Compressor # 4A
Number of Devices: 1
Manufacturer: Waukesha Make: Model: VRG220U Serial No:
Rated Heat Input: BSFC: Parameter Size: 48.00 Horsepower
Part-70 Insignificant: No
APCD Rule Exemption Basis: 202.F.1.f. Spark ignition piston-type ICEs < =50 bhp
Device Description: 48 hp air compressor engine.

3 **IC Engine: Air Compressor # 5A**
Device Number: 001222 Operator ID Number: Air Compressor # 5A
Number of Devices: 1
Manufacturer: Waukesha Make: Model: VRG220U Serial No:
Rated Heat Input: BSFC: Parameter Size: 48.00 Horsepower
Part-70 Insignificant: No
APCD Rule Exemption Basis: 202.F.1.f. Spark ignition piston-type ICEs < =50 bhp
Device Description: 48 hp air compressor engine.

2 **IC Engine: Emergency Electrical Generator**
Device Number: 008665 Operator ID Number:
Number of Devices: 1
Manufacturer: Waukesha Make: Model: F817GU Serial No:
Rated Heat Input: BSFC: Parameter Size: 160.00 Horsepower
Part-70 Insignificant: Yes
APCD Rule Exemption Basis: 202.F.1.d.Spark ignition piston-type ICEs for emergency electrical power generation
Device Description: Operated < 200 hours/year; also included in Part 70 Insignificant Activities.

5 **Hot Water Heaters**
Device Number: 100915 Operator ID Number:
Number of Devices: 1
Manufacturer: Make: Model: Serial No:
Rated Heat Input: BSFC: Parameter Size:
Part-70 Insignificant: Yes
APCD Rule Exemption Basis: 202.G.1Combustion Equipment < 5 MMBtu/hr
Device Description: Also included in Part 70 Insignificant Activities.

6 **Glycol/Glycol Heat Exchanger**
Device Number: 100890 Operator ID Number:

Number of Devices: 1
Manufacturer: Brown Fin Tube Make: Model: Serial No:
Rated Heat Input: Parameter Size:
Part-70 Insignificant: Yes
APCD Rule Exemption Basis: 202.L.1 Heat Exchangers
Device Description: Parts # E-301, E-302 & E-303, piped in series, 6.5' tall by 24' long; also included in Part 70 Insignificant Activities.

7 **Glycol/Oil Heat Exchanger**
Device Number: 100891 Operator ID Number: E-304
Number of Devices: 1
Manufacturer: Brown Fin Tube Make: Model: Serial No:
Rated Heat Input: Parameter Size:
Part-70 Insignificant: Yes
APCD Rule Exemption Basis: 202.L.1 Heat Exchangers
Device Description: 2.5' tall by 20' long, single pass, one component unit; also included in Part 70 Insignificant Activities.

8 **Glycol Storage Tanks**
Device Number: 100910 Operator ID Number:
Number of Devices: 3
Manufacturer: Make: Model: Serial No:
Parameter Size:
Part-70 Insignificant: Yes
APCD Rule Exemption Basis: 202.V.1Unheat Storage Of Lqd Org Mtls W/Bp >=300 @ 1 Atm
Device Description: Two (2) glycol storage tanks and one glycol run tank; also included in Part 70 Insignificant Activities.

9 **Diesel Tanks**
Device Number: 100911 Operator ID Number:
Number of Devices: 3
Manufacturer: Make: Model: Serial No:
Parameter Size:
Part-70 Insignificant: Yes
APCD Rule Exemption Basis: 202.V.2Storage Of Refined Fuel Oil W/Grav <=40 API
Device Description: Two 110 gallons and one 600 gallons capacity; also included in Part 70 Insignificant Activities.

10 **Lube Oil Tanks**
Device Number: 100912 Operator ID Number:
Number of Devices: 3
Manufacturer: Make: Model: Serial No:
Parameter Size: 5000.00 Gallons
Part-70 Insignificant: Yes
APCD Rule Exemption Basis: 202.V.3Storage Of Lubricating Oils
Device Description: 5000 gallons capacity each. Also included in Part 70 Insignificant Activities.

11 **Degreaser Unit**
Device Number: 100913 Operator ID Number:
Number of Devices: 1
Manufacturer: JRI Make: Model: TL 21 Serial No:
Parameter Size:

Part-70 Insignificant: Yes
APCD Rule Exemption Basis: 202.U.2.c. Use Materials W/Volatile Org Cmpnd <= 2% By Wt
Device Description: Using non-ROC solvent; also included in Part 70 Insignificant Activities.

12 Wipe Cleaning Solvent Usage

Device Number: 100914 Operator ID Number:
Number of Devices: 1
Manufacturer: Make: Model: Serial No:
Parameter Size:
Part-70 Insignificant: Yes
APCD Rule Exemption Basis: 202.U.3Equipment Used In Wipe Cleaning Operations (<55 Gal/Yr At the Source)
Device Description: Also included in Part 70 Insignificant Activities.

10.7 De-Permitted Equipment

1 **Underground Gasoline Storage Tank**
Device Number: 100905 Operator ID Number:
Number of Devices: 1
Manufacturer: Make: Model: Serial No:
Parameter Size: 12000.00 Gallons
Part-70 Insignificant: No
APCD Rule Exemption Basis: 202.V.2Storage Of Refined Fuel Oil W/Grav <=40 API
Device Description: Effective this permit (9584-R2), this unit is de-permitted.

2 **Phase I Vapor Recovery**
Device Number: 100906 Operator ID Number:
Number of Devices: 1
Manufacturer: Make: Model: Serial No:
Parameter Size:
Device Description: OPW Two Point system. Effective this permit (9584-R2), this unit is de-permitted.

3 **Gasoline Dispensing Cabinet**
Device Number: 100907 Operator ID Number:
Number of Devices: 1
Manufacturer: Make: Model: Serial No:
Parameter Size:
Device Description: With one dispensing nozzle. Effective this permit (9584-R2), this unit is de-permitted.

4 **Phase II Vapor Recovery system**
Device Number: 100908 Operator ID Number:
Number of Devices: 1
Manufacturer: Make: Model: Serial No:
Parameter Size:
Device Description: This equipment has been de-permitted effective this permit

5 **IC Engine: Well Water Pump # 14A**
Device Number: 001209 Operator ID Number: Well Water Pump # 14A
Number of Devices: 1
Manufacturer: Waukesha Make: Model: 6BZ-2C Serial No:
Rated Heat Input: BSFC: Parameter Size: 54.00 Horsepower
Device Description: 54 hp well water pump engine. This unit has been de-permitted in this PTO based on a request from SoCalGas.

6 **IC Engine: Electrical Generator #1A**
Device Number: 005666 Operator ID Number: Electrical Generator #1A
Number of Devices: 1
Manufacturer: Waukesha Make: Model: 6WAK-79A Serial No:
Rated Heat Input: BSFC: 11000.00 BTU/bhp-hr Parameter Size: 170.00 Horsepower

Device Description: 170 hp electrical generator. Effective this permit (9584-R2), this unit is de-permitted.

7 **IC Engine: Electrical Generator #2A**
Device Number: 005667 Operator ID Number: Electrical Generator #2A
Number of Devices: 1
Manufacturer: Waukesha Make: Model: 6WAK-79A Serial No:
Rated Heat Input: BSFC: 11000.00 BTU/bhp-hr Parameter Size: 170.00 Horsepower
Device Description: 170 hp electrical generator. Effective this permit (9584-R2), this unit is de-permitted.

8 **IC Engine: Electrical Generator #3A**
Device Number: 005668 Operator ID Number: Electrical Generator #3A
Number of Devices: 1
Manufacturer: Waukesha Make: Model: 6WAK-79A Serial No:
Rated Heat Input: BSFC: 11000.00 BTU/bhp-hr Parameter Size: 170.00 Horsepower Parameter Size: 170.00 Horsepower
Device Description: 170 hp electrical generator. Effective this permit (9584-R2), this unit is de-permitted.

9 **IC Engine: Electrical Generator #20A**
Device Number: 005669 Operator ID Number: Electrical Generator #20A
Number of Devices: 1
Manufacturer: Waukesha Make: Model: 145-GZU Serial No:
Rated Heat Input: BSFC: 11231.00 BTU/bhp-hr Parameter Size: 144.00 Horsepower Parameter Size: 144.00 Horsepower
Device Description: 144 hp electrical generator. Effective this permit (9584-R2), this unit is de-permitted.

10.8 Permittee Comments on the Draft Permit and the APCD Responses

SoCalGas Comments on Draft Part 70/APCD PTO NO. 9584-R3 (LaGoleta Plant)

No.	Page/ Section	SoCalGas Citation and Issue	SoCalGas Proposed Resolution	APCD Response
1	Table 5.4-1A	The acrolein emission factor for MU 9 should be 4.85E-03, not 4.59E-03.	Correct the EF.	Done, Section 4.11 was also corrected.
2	Table 4.2	The catalyst inlet temperature limit should be 610 deg F, not 675 deg F	Correct the limit.	Done.
3	Table 4.3	The fuel gas analysis should be done semi-annually, not quarterly.	Revise to match the permit condition.	Done.
4	3.2.6	The reference to 9.C.18 for CAM conditions should be to 9.C.1(c)(ii) instead.	Update the reference.	Done
5	9.C.1(b)	Conditions (b)(vi)A through E can be deleted. His information is now included in the I&M Plan or the CAM Plan. There is no need for a separate IC Engine Compliance Plan.	Delete the conditions.	Condition (b)(vi)A, which referenced the compliance plan, was deleted. The other conditions were retained but any references to the IC engine compliance plan were removed. Since the operational requirements are already in the permit or in the I&M or CAM Plans the Compliance Plan is no longer necessary, but the permit conditions enforcing operational requirements were retained.
6	9.C.1(b)	(b)(vi)C contains a prescribed oxygen sensor replacement frequency. Newer sensors are becoming available which may greatly extend sensor life. I don't want the permit to limit our ability to improve the system and thereby encourage compliance assurance.	Remove the replacement frequency requirement.	The condition was revised to require sensor replacement according to the I&M Plan. The current plan requires sensor replacement every 1000 hours, but if SoCal Gas wants to use newer sensors with longer replacement intervals they may submit a revised I&M Plan for approval.

No.	Page/ Section	SoCalGas Citation and Issue	SoCalGas Proposed Resolution	APCD Response
7	4.9.2	The Air Fuel Ratio Controller is listed under the process monitoring discussion. This is not covered by the Process Monitor Calibration and Maintenance Plan, it is covered by the CAM Plan.	Remove the AFRC from the list of items covered by the Process Monitor Calibration and Maintenance Plan.	Done.
8	C.15	The IC Engine Compliance plan can be removed from the list of documents incorporated by reference, since it is incorporated into the permit and the I&M and CAM plans.	Delete C.15(iii)	Done