



JUL 02 2013

Mr. Robert Boston
Berry Petroleum Company
5201 Truxtun Avenue Suite 300
Bakersfield, CA 93309

**Re: Notice of Preliminary Decision – Prevention of Significant Deterioration / ATC / Certificate of Conformity (Title V Significant Modification)
Facility # S-1246
Project # S-1111978**

Dear Mr. Boston:

Enclosed for your review is the District's engineering evaluation of an application for Authorities to Construct for Berry Petroleum Company operation in the Midway Sunset oilfield, CA, which has been issued a Title V permit. Berry Petroleum Company is requesting that Certificates of Conformity, with the procedural requirements of 40 CFR Part 70, be issued with this project. The proposed ATCs are subject to the requirements of Rule 2201 – New and Modified Stationary Source Review and Rule 2410 – Prevention of Significant Deterioration.

Berry is requesting Authorities to Construct (ATC) for five (5) new 85 MMBtu/hr natural gas-fired steam generators and an increasing the number of thermally enhanced oil recovery (TEOR) wells from 875 to 1015 for TEOR operation S-1246-296.

After addressing all comments made during the 30-day public notice and the 45-day EPA comment periods, the Authority to Construct will be issued to the facility with a Certificate of Conformity. Prior to operating with modifications authorized by the Authority to Construct, the facility must submit an application to modify the Title V permit as an administrative amendment, in accordance with District Rule 2520, Section 11.5.

The public notice will be published approximately three days from the date of this letter. Please submit your written comments within the 30-day public comment period which begins on the date of publication of the public notice.

Seyed Sadredin
Executive Director/Air Pollution Control Officer

Northern Region
4800 Enterprise Way
Modesto, CA 95356-8718
Tel: (209) 557-6400 FAX: (209) 557-6475

Central Region (Main Office)
1990 E. Gettysburg Avenue
Fresno, CA 93726-0244
Tel: (559) 230-6000 FAX: (559) 230-6061

Southern Region
34946 Flyover Court
Bakersfield, CA 93308-9725
Tel: 661-392-5500 FAX: 661-392-5585

Dear Mr. Boston
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If you have any questions, please contact Mr. Leonard Scandura, Permit Services Manager, at (61) 392-5500.

Thank you for your cooperation in this matter.

Sincerely,

A handwritten signature in black ink, appearing to read "D. Warner", with a long horizontal flourish extending to the right.

David Warner
Director of Permit Services

DW:SD/st

Enclosures

cc: distribution list

Distribution list

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Diamond Bar, CA 91765

Santa Ynez Tribe
c/o Tribal Council P O Box 517 Santa Ynez, CA 93460

**NOTICE OF PRELIMINARY DECISION
FOR THE ISSUANCE OF AUTHORITY TO CONSTRUCT AND
THE PROPOSED SIGNIFICANT MODIFICATION OF FEDERALLY
MANDATED OPERATING PERMIT AND PREVENTION OF SIGNIFICANT
DETERIORATION NOTIFICATION**

NOTICE IS HEREBY GIVEN that the San Joaquin Valley Air Pollution Control District solicits public comment on the proposed issuance of Authority To Construct to Berry Petroleum Company for operation in Midway Sunset oilfield, CA, which has been issued a Title V permit. Berry Petroleum Company is requesting that Certificates of Conformity, with the procedural requirements of 40 CFR Part 70, be issued with this project. The proposed ATCs are subject to the requirements of Rule 2201 – New and Modified Stationary Source Review and Rule 2410 – Prevention of Significant Deterioration.

Berry is requesting Authorities to Construct (ATC) for five (5) new 85 MMBtu/hr natural gas-fired steam generators, an increase in the number of thermally enhanced oil recovery (TEOR) wells from 875 to 1015 for TEOR operation S-1246-296. These proposed modifications will result in a significant emission increase, subject to the requirements of Rule 2410, of 217,793 ton/year of CO₂e. There is no increment consumption of any attainment pollutant.

The analysis of the regulatory basis for these proposed actions, Project #S-1111978, is available for public inspection at http://www.valleyair.org/notices/public_notices_idx.htm and the District office at the address below. If requested by the public, the District will hold a public hearing regarding proposed issuance of the subject ATCs.

Written comments on the proposed initial permit must be submitted by August 6, 2013 to **DAVID WARNER, DIRECTOR OF PERMIT SERVICES, SAN JOAQUIN VALLEY AIR POLLUTION CONTROL DISTRICT, 34946 FLYOVER COURT, BAKERSFIELD, CA 93308.**

San Joaquin Valley Air Pollution Control District

Authority to Construct Application Review

Five New 85.0 MMBtu/hr Steam Generators and the Addition of 260 TEOR Wells

Facility Name: Berry Petroleum Company Date: May 21, 2013
Mailing Address: 5201 Truxtun Ave. Engineer: Steve Davidson
Bakersfield, CA 93309-0640 Lead Engineer: Allan Phillips *AP SURV A QIE*
Contact Person: Robert Boston JUN 12 2013
Telephone: 661-616-3900
Fax: 661-616-3891
E-Mail: jil@bry.com
Application #(s): S-1246-296-23, '-364-0, '-365-0, '-366-0, '-367-0, and '-368-0
Project #: S-1111978
Deemed Complete: November 7, 2012

I. Proposal

Berry Petroleum Company (hereafter referred to as BPC) operates oil and gas production facilities. BPC has requested Authorities to Construct (ATC) five new 85.0 MMBtu/hr gas-fired (natural and ethane-rich natural gas) steam generators (S-1246-364-0, '-365-0, '-366-0, '-367-0, and '-368-0), the addition of 260 Thermally Enhanced Oil Recovery (TEOR) wells, and the removal of a 1,600 bbl crude oil storage tank (S-1246-215).

These applications are a separate "project" from other recently issued and pending applications submitted by BPC for new steam generators, as the proposed steam generators are not economically dependent or technically dependent on the installation of the other proposed steam generators. See further discussion in Section VII C 9 - Rule 2410 - Prevention of Significant Deterioration Applicability.

For mitigation of VOC emissions, Berry has proposed to delete tank S-1246-215. Per Rule 2201, Section 3.39 a Stationary Source Project is a single permitting action involving the modification, addition or shutdown of one or more emissions units. If any increase in emissions from a new or modified emissions unit is permitted based on emission reductions from one or more emissions units included in the stationary source project, the following condition must also be met:

The modification or shutdown resulting in the necessary emission reductions shall occur not later than the date of initial operation of the new or modified emissions unit. If the new or modified emissions unit is, in whole or in part, a replacement for an existing emissions unit at the same stationary source, the APCO may allow a maximum of 90 days as a start up period for simultaneous operation of the existing emissions unit and the replacement emissions unit.

The following condition will be placed on ATCs in this project:

- Prior to startup of the equipment authorized by this Authority to Construct, Permit to Operate S-1246-215 shall be surrendered to the District and the associated equipment shall be removed or rendered inoperable. [District Rule 2201]

The project is a Rule 2201 Federal Major Modification. BACT and offsets are required. The project is also subject to the requirements of Rule 2410 due to a significant emission increase of CO₂e emissions. The public noticing requirements of Rule 2201 and Rule 2410 are required.

BPC has a Title V Permit. This project is a Federal Major Modification; therefore, it is classified as a Title V Significant Modification pursuant to Rule 2520, Section 3.29, and can be processed with a Certificate of Conformity (COC). Since the facility has specifically requested that this project be processed in that manner, the 45-day EPA comment period will be satisfied prior to the issuance of the Authority to Construct. BPC must apply to administratively amend their Title V permit.

II. Applicable Rules

Rule 2201	New and Modified Stationary Source Review Rule (4/21/11)
Rule 2410	Prevention of Significant Deterioration (adopted 6/16/2011, effective 12/26/12)
Rule 2520	Federally Mandated Operating Permits (6/21/01)
Rule 4001	New Source Performance Standards (4/14/99)
Rule 4101	Visible Emissions (2/17/05)
Rule 4102	Nuisance (12/17/92)
Rule 4201	Particulate Matter Concentration (12/17/92)
Rule 4301	Fuel Burning Equipment (12/17/92)
Rule 4304	Equipment Tuning Procedure for Boilers, Steam Generators and Process Heaters (10/19/95)
Rule 4305	Boilers, Steam Generators and Process Heaters – Phase II (8/21/03)
Rule 4306	Boilers, Steam Generators and Process Heaters – Phase III (10/16/08)
Rule 4320	Advanced Emission Reduction Options for Boilers, Steam Generators, and Process Heaters Greater than 5.0 MMBtu/hr (10/16/08)
Rule 4401	Steam Enhanced Crude Oil Production Well Vents (6/16/11)
Rule 4801	Sulfur Compounds (12/17/92)
CH&SC 41700	Health Risk Assessment
CH&SC 42301.6	School Notice
Public Resources Code 21000-21177: California Environmental Quality Act (CEQA)	
California Code of Regulations, Title 14, Division 6, Chapter 3, Sections 15000-15387: CEQA Guidelines	

III. Project Location

The steam generators will be permitted to be installed at any of the following various specified locations within the North Midway Sunset Oil Field at BPC's Heavy Oil Western Stationary Source:

Possible Steam Generator Locations					
	Section	Township	Range	Latitude	Longitude
S-1246-364-0, '-365-0, '-366-0, '-367-0, and '-368-0	NE11	31S	22E	35° 15' 07.91" N	-119° 34' 55.68" E
	NE11	31S	22E	35° 15' 02.64" N	-119° 34' 53.05" E
	NW11	31S	22E	35° 15' 00.61" N	-119° 34' 31.67" E
	SW02	31S	22E	35° 15' 10.99" N	-119° 34' 35.39" E

The TEOR system in this project is located in Sections 1, 2, 3, 11, and 12 of Township 31S, Range 22E.

Tank S-1246-215 which will be removed upon implementation of the equipment is located Section: 34, Township: 12N, Range 24W.

The equipment is not located within 1,000 feet of the outer boundary of a K-12 school. Therefore, the public notification requirement of California Health and Safety Code 42301.6 is not applicable to this project.

IV. Process Description

BPC operates permitted equipment within their Heavy Oil Western stationary source, utilized for the thermally enhanced production of crude oil and natural gas. In thermally enhanced oil recovery (TEOR), natural gas is combusted in steam generators to produce steam for injection into heavy crude oil bearing strata via injection wells to reduce viscosity of the crude oil, thereby facilitating thermally enhanced oil production.

V. Equipment Listing

Pre-Project Equipment Description:

~~S-1246-215-3: 67,200 GALLON FIXED ROOF PETROLEUM STORAGE TANK (To be cancelled upon implementation of S-1246-296-23 or '-364-0 through '-368-0)~~

S-1246-296-28: MODIFICATION OF THERMALLY ENHANCED OIL RECOVERY (TEOR) OPERATION WELL VENT VAPOR CONTROL SYSTEM SERVING 1200 WELLS INCLUDING GAS/LIQUID SEPARATORS, HEAT EXCHANGERS, COMPRESSORS, INLET SEPARATOR VESSELS, CONDENSATE PUMPS, SULFUR SCRUBBER, VAPOR PIPING FROM TANKS '337 AND '339 AND VAPOR PIPING TO STEAM GENERATORS S-1246-3, '-24, '-46, '-119, '-292, '-293, '-342, '-343, '-344, '-345, '-346, '-355, '-356, '-357, '-358, AND '-359 AND/OR DOGGR APPROVED GAS DISPOSAL WELLS (NMWSS): INCREASE NUMBER OF WELLS FROM 1200 TO 1350 AND INSTALL ADDITIONAL VAPOR RECOVERY COMPRESSORS

Proposed Modification:

S-1246-296-28: MODIFICATION OF THERMALLY ENHANCED OIL RECOVERY (TEOR) OPERATION WELL VENT VAPOR CONTROL SYSTEM SERVING 1350 WELLS INCLUDING GAS/LIQUID SEPARATORS, HEAT EXCHANGERS, COMPRESSORS, INLET SEPARATOR VESSELS, CONDENSATE PUMPS, SULFUR SCRUBBER, VAPOR PIPING FROM TANKS '337 AND '339 AND VAPOR PIPING TO STEAM GENERATORS S-1246-3, '-24, '-46, '-119, '-292, '-293, '-342, '343, '344, '345, '346 AND/OR DOGGR APPROVED GAS DISPOSAL WELLS (NMWSS): INCREASE WELL COUNT BY 260 WELLS

Installation the Following Steam Generators:

- S-1246-364-0: 85 MMBTU/HR NATURAL/ETHANE-RICH NATURAL/TEOR/TVR GAS-FIRED STEAM GENERATOR (MJN-437) WITH A NORTH AMERICAN MAGNA FLAME LE ULTRA LOW NOX BURNER, FLUE GAS RECIRCULATION (FGR) AND AN O2 CONTROLLER
- S-1246-365-0: 85 MMBTU/HR NATURAL/ETHANE-RICH NATURAL/TEOR/TVR GAS-FIRED STEAM GENERATOR (MJN-438) WITH A NORTH AMERICAN MAGNA FLAME LE ULTRA LOW NOX BURNER, FLUE GAS RECIRCULATION (FGR) AND AN O2 CONTROLLER
- S-1246-366-0: 85 MMBTU/HR NATURAL/ETHANE-RICH NATURAL/TEOR/TVR GAS-FIRED STEAM GENERATOR (MJN-439) WITH A NORTH AMERICAN MAGNA FLAME LE ULTRA LOW NOX BURNER, FLUE GAS RECIRCULATION (FGR) AND AN O2 CONTROLLER
- S-1246-367-0: 85 MMBTU/HR NATURAL/ETHANE-RICH NATURAL/TEOR/TVR GAS-FIRED STEAM GENERATOR (MJN-440) WITH A NORTH AMERICAN MAGNA FLAME LE ULTRA LOW NOX BURNER, FLUE GAS RECIRCULATION (FGR) AND AN O2 CONTROLLER
- S-1246-368-0: 85 MMBTU/HR NATURAL/ETHANE-RICH NATURAL/TEOR/TVR GAS-FIRED STEAM GENERATOR (MJN-441) WITH A NORTH AMERICAN MAGNA FLAME LE ULTRA LOW NOX BURNER, FLUE GAS RECIRCULATION (FGR) AND AN O2 CONTROLLER

Post Project Equipment Description:

S-1246-296-23: THERMALLY ENHANCED OIL RECOVERY (TEOR) OPERATION WELL VENT VAPOR CONTROL SYSTEM SERVING 1610 WELLS INCLUDING GAS/LIQUID SEPARATORS, HEAT EXCHANGERS, COMPRESSORS, INLET SEPARATOR VESSELS, CONDENSATE PUMPS, SULFUR SCRUBBER, VAPOR PIPING FROM TANKS '337 AND '339 AND VAPOR PIPING TO STEAM GENERATORS S-1246-3, '-24, '-46, '-119, '-292, '-293, '-342, '-343, '-344, '-345, '-346, '-355, '-356, '-357, '-358, '-359 AND/OR DOGGR APPROVED GAS DISPOSAL WELLS (NMWSS)

- S-1246-364-0: 85 MMBTU/HR NATURAL/ETHANE-RICH NATURAL/TEOR/TVR GAS-FIRED STEAM GENERATOR (MJN-437) WITH A NORTH AMERICAN MAGNA FLAME LE ULTRA LOW NOX BURNER, FLUE GAS RECIRCULATION (FGR) AND AN O2 CONTROLLER
- S-1246-365-0: 85 MMBTU/HR NATURAL/ETHANE-RICH NATURAL/TEOR/TVR GAS-FIRED STEAM GENERATOR (MJN-438) WITH A NORTH AMERICAN MAGNA FLAME LE ULTRA LOW NOX BURNER, FLUE GAS RECIRCULATION (FGR) AND AN O2 CONTROLLER
- S-1246-366-0: 85 MMBTU/HR NATURAL/ETHANE-RICH NATURAL/TEOR/TVR GAS-FIRED STEAM GENERATOR (MJN-439) WITH A NORTH AMERICAN MAGNA FLAME LE ULTRA LOW NOX BURNER, FLUE GAS RECIRCULATION (FGR) AND AN O2 CONTROLLER
- S-1246-367-0: 85 MMBTU/HR NATURAL/ETHANE-RICH NATURAL/TEOR/TVR GAS-FIRED STEAM GENERATOR (MJN-440) WITH A NORTH AMERICAN MAGNA FLAME LE ULTRA LOW NOX BURNER, FLUE GAS RECIRCULATION (FGR) AND AN O2 CONTROLLER
- S-1246-368-0: 85 MMBTU/HR NATURAL/ETHANE-RICH NATURAL/TEOR/TVR GAS-FIRED STEAM GENERATOR (MJN-441) WITH A NORTH AMERICAN MAGNA FLAME LE ULTRA LOW NOX BURNER, FLUE GAS RECIRCULATION (FGR) AND AN O2 CONTROLLER

VI. Emission Control Technology Evaluation

TEOR System (S-1246-296):

If the wells are operated with closed casing vents, where casing vents are connected to production flow lines, then the oil production will be routed to front line production tanks with vapor recovery systems. Otherwise, the casing vents will be connected to a dedicated well vent vapor recovery system, and production may be processed in tanks equipped with or without vapor recovery systems.

In general the pressure of the gas handled by components (seals, valves, flanges, etc.) exceeds atmospheric pressure. Fugitive emissions from leaking components are minimized by a leak inspection and maintenance program consistent with Rule 4401.

Steam Generators (S-1246-364-0, '-365-0, '-366-0, '-367-0, and '-368-0):

Emissions from natural gas-fired steam generators include NO_x, CO, VOC, PM₁₀, and SO_x.

NO_x is the major pollutant of concern when burning natural gas. NO_x formation is either due to thermal fixation of atmospheric nitrogen in the combustion air (thermal NO_x) or due to conversion of chemically bound nitrogen in the fuel (fuel NO_x). Due to the low fuel nitrogen content of natural gas, nearly all NO_x emissions are thermal NO_x. Formation of thermal NO_x is affected by four

furnace zone factors: (1) nitrogen concentration, (2) oxygen concentration, (3) peak temperature, and (4) time of exposure at peak temperature.

Flue gas recirculation (FGR) reduces NO_x emissions by recirculating a percentage of the exhaust gas back into the windbox. This reduces the oxygen concentration in the air-fuel mixture and regulates the combustion process, lowering the combustion temperature. The lowered availability of oxygen in conjunction with lowered combustion temperature reduces the formation of NO_x.

BPC will comply with Rule 4320 by limiting the burners to 7 ppm-NO_x @ 3% O₂ (or 0.008 lb-NO_x/MMBtu) and limiting the fuel sulfur content to 1 gr-S/100 dscf.

BPC will comply with BACT by combusting natural or ethane-rich natural gas provided from a nearby gas plant, where ethane, other heavier hydrocarbons and inert compounds are removed to produce a utility quality natural gas for general sale. The gas plant will provide gas to BPC under contract and will blend the ethane with methane and other components to achieve a gross heating value of that is comparable to the gas that BPC is currently using – between 1,000 and 1,100 Btu/scf. The use of the blended ethane gas is not expected to be significantly different from natural gas.

BPC will comply with BACT for CO₂e by installing a convection section with at least 235 square feet of heat transfer surface area per MMBtu/hr of maximum rated heat input. This will improve the steam generators expected overall efficiency to a least 88%. Additionally, the steam generators will be equipped with variable frequency drives and high efficiency electrical motors driving the blower and water pump.

VII. General Calculations

A. Assumptions

- The maximum operating schedule is 24 hours per day (per applicant)

Tank S-1246-215:

- Tank emissions are calculated at 2 turnovers per day

TEOR Operation S-1246-296:

- Leaking components (i.e. >10,000 ppm) will be limited to maximum amount allowed by Rule 4401
- Leaking components are all assessed to valves (worst case leaking component – gas/light liquid valves)
- Emissions from the TEOR system are comprised of VOC only
- Total Number of pre-project wells is 1350 wells
- Total Number of Post Project wells is 1610 wells
- Facility will operate 24 hours per day 365 days per year.

Steam Generators S-1246-364-0, '-365-0, '-366-0, '-367-0, and '-368-0:

- Steam generators are fired solely on natural gas or ethane-rich natural gas (limited to 1 gr-S/100 dscf, per applicant)
- Maximum Heat Input: 85.0 MMBtu/hr (per applicant)
- Annual potential to emit is calculated based on 8,760 hours of operation per year
- EPA F-factor for natural gas is 8,578 dscf/MMBtu (40 CFR 60, Appendix B)
- Molar Specific Volume of a gas @ 60 °F is 379.5 ft³/lb-mol
- Natural Gas Heating Value: 1,000 Btu/scf (District Practice)

B. Emission Factors

Pollutant	Emission Factors (EF)		Source
NO _x	0.008 lb-NO _x /MMBtu	7 ppmv NO _x (@ 3%O ₂)	Rule 4320, Table 1 Category C.2.a
SO _x	0.005 lb SO _x /MMBtu	1.75 gr-S/100 dscf	Applicant Proposed (Scrubbed gas)
PM10	0.0055 lb-PM10/MMBtu	--	Applicant Proposed
CO	0.026 lb-CO/MMBtu	35 ppmv CO (@3% O ₂)	Proposed by Applicant
VOC	0.0055 lb-VOC/MMBtu	--	AP-42 (07/98) Table 1.4-2

The potential to emit from the TEOR operation S-1246-296 will be recalculated using California Implementation Guidelines for Estimating Mass Emissions of fugitive Hydrocarbon Leaks at Petroleum Facilities, CAPCOA/CARB, February 1999. Applicant is proposing use of the "revised screening" emission factors.

C. Calculations

1. Pre-Project Potential to Emit (PE1)

Tank S-1246-215:

The daily and annual emissions from this tank are summarized in the table below (see Appendix H for tank emission calculation and support documentation showing this tank had a minimum of 2 turnovers/day over a 5-year period):

PE1: S-1246-215	
	VOC
Daily Emissions (lb/day)	165.2
Annual Emissions (lb/yr)	60,292

TEOR Operation S-1246-296:

The daily and annual emissions from this TEOR system are summarized in the table below (DEL of S-1246-296-28):



PE1 S-1246-296	
	VOC
Daily Emissions (lb/day)	584.6
Annual Emissions (lb/yr)	213,379

Steam Generators S-1246-364-0, '-365-0, '-366-0, '-367-0, and '-368-0:

Since these are new emissions units, PE1 = 0 for all pollutants.

2. Post Project Potential to Emit (PE2)

Tank S-1246-215:

This tank will be shut down as a result of implementing ATCs issued in this project; therefore all emissions from this tank will be equal to zero.

TEOR Operation S-1246-296:



The daily and annual emissions from this TEOR system are summarized in the table below (see Appendix I for fugitive emission calculation):

PE2 S-1246-296	
	VOC
Daily Emissions (lb/day)	688.1
Annual Emissions (lb/yr)	251,156

Steam Generators S-1246-364-0, '-365-0, '-366-0, '-367-0, and '-368-0:

Emissions are calculated with the following equation and summarized on the following table (emissions are identical for each steam generator):

$$PE2 = EF \text{ (lb/MMBtu)} \times \text{Heat Input (MMBtu)} \times \text{Operating Schedule (hours)}$$



Daily PE2				
Pollutant	EF2 (lb/MMBtu)	Heat Input (MMBtu/hr)	Operating Schedule (hr/day)	Daily PE2 (lb/day)
NO _x	0.008	85	24	16.3
SO _x	0.00500	85	24	10.2
PM ₁₀	0.0055	85	24	11.2
CO	0.026	85	24	53.0
VOC	0.0055	85	24	11.2

Annual PE2				
Pollutant	EF2 (lb/MMBtu)	Heat Input (MMBtu/hr)	Operating Schedule (hr/year)	Annual PE2 (lb/year)
NO _x	0.008	85	8,760	5,957
SO _x	0.00500	85	8,760	3,723
PM ₁₀	0.0055	85	8,760	4,095
CO	0.026	85	8,760	19,360
VOC	0.0055	85	8,760	4,095

Green House Gas Basis and Assumptions

- The each steam generator is fired with natural gas at a rate of 85 MMBtu/hour (HHV) (total steam generator project input 425 MMBtu)
- The steam generators operate 8,760 hours per year and is in commercial/institutional service
- Emission factors and global warming potentials (GWP) are taken from the California Climate Change Action Registry (CCAR), Version 3.1, January, 2009 (Appendix C, Tables C.7 and C.8):

CO₂ 53.06 kg/MMBtu (HHV) natural gas (116.7 lb/MMBtu)
 CH₄ 0.005 kg/MMBtu (HHV) natural gas (0.011 lb/MMBtu)
 N₂O 0.0001 kg/MMBtu (HHV) natural gas (0.00022 lb/MMBtu)

GWP for CH₄ = 21 lb-CO₂e per lb-CH₄
 GWP for N₂O = 310 lb-CO₂e per lb-N₂O

Calculations

Hourly Emissions

CO₂ Emissions = 85.0 MMBtu/hr x 116.7 lb/MMBtu = 9,919.5 lb-CO₂e/hour
 CH₄ Emissions = 85.0 MMBtu/hr x 0.011 lb/MMBtu x 21 lb-CO₂e per lb-CH₄ = 19.6 lb-CO₂e/hour
 N₂O Emissions = 85.0 MMBtu/hr x 0.00022 lb/MMBtu x 310 lb-CO₂e per lb-N₂O = 5.8 lb-CO₂e/hour

Total = $9,919.5 + 19.6 + 5.8 = 9,944.9$ lb-CO₂e/hour per steam generator

Total Project (5 steam generators) = 49,724.5 lb-CO₂e/hour

Annual Emissions

$49,724.5$ lb-CO₂e/hour x 8,760 hr/year + 2,000 lb/ton = 217,793 tons-CO₂e/year

Metric Conversion

$217,793$ short tons-CO₂e/year x 0.9072 metric tons/short ton = 197,582 metric tons-CO₂e/year

3. Pre-Project Stationary Source Potential to Emit (SSPE1)

Pursuant to Section 4.9 of District Rule 2201, the Pre-Project Stationary Source Potential to Emit (SSPE1) is the Potential to Emit (PE) from all units with valid Authorities to Construct (ATC) or Permits to Operate (PTO) at the Stationary Source and the quantity of emission reduction credits (ERC) which have been banked since September 19, 1991 for Actual Emissions Reductions that have occurred at the source, and which have not been used on-site.

Facility emissions are already above the Offset and Major Source Thresholds for NO_x, SO_x, PM₁₀, CO, and VOC emissions; therefore, SSPE1 calculations are not necessary.

4. Post Project Stationary Source Potential to Emit (SSPE2)

Pursuant to Section 4.10 of District Rule 2201, the Post Project Stationary Source Potential to Emit (SSPE2) is the Potential to Emit (PE) from all units with valid Authorities to Construct (ATC) or Permits to Operate (PTO) at the Stationary Source and the quantity of emission reduction credits (ERC) which have been banked since September 19, 1991 for Actual Emissions Reductions that have occurred at the source, and which have not been used on-site.

Facility emissions are already above the Offset and Major Source Thresholds for NO_x, SO_x, PM₁₀, CO, and VOC emissions; therefore, SSPE2 calculations are not necessary.

5. Major Source Determination

Rule 2201 Major Source Determination:

Pursuant to Section 3.23 of District Rule 2201, a Major Source is a stationary source with post-project emissions or a Post Project Stationary Source Potential to Emit (SSPE2), equal to or exceeding one or more of the following threshold values. However, Section 3.23.2 states, "for the purposes of determining major source status, the SSPE2 shall not include the quantity of emission reduction credits (ERC) which

have been banked since September 19, 1991 for Actual Emissions Reductions that have occurred at the source, and which have not been used on-site.”

This source is an existing Major Source for NO_x, SO_x, PM₁₀, CO, and VOC emissions and will remain a Major Source for NO_x, SO_x, PM₁₀, CO, and VOC. No change in other pollutants are proposed or expected as a result of this project.

Rule 2410 Major Source Determination:

The facility or the equipment evaluated under this project is listed as one of the categories specified in 40 CFR 52.21 (b)(1)(i). Therefore the following PSD Major Source thresholds are applicable.

PSD Major Source Determination (tons/year)							
	NO2	VOC	SO2	CO	PM	PM10	CO2e
PSD Major Source Thresholds	250	250	250	250	250	250	100,000

The facility stipulates that this is a Rule 2410 stationary source, i.e. contiguous and adjacent properties, constitute a Rule 2410 major source. As such, no emission calculations will be conducted.

6. Baseline Emissions (BE)

The BE calculation (in lbs/year) is performed pollutant-by-pollutant for each unit within the project, to calculate the QNEC and if applicable, to determine the amount of offsets required.

Pursuant to Section 3.7 of District Rule 2201, BE = Pre-project Potential to Emit for:

- Any unit located at a non-Major Source,
- Any Highly-Utilized Emissions Unit, located at a Major Source,
- Any Fully-Offset Emissions Unit, located at a Major Source, or
- Any Clean Emissions Unit, located at a Major Source.

otherwise,

BE = Historic Actual Emissions (HAE), calculated pursuant to Section 3.22 of District Rule 2201.

Pursuant to Rule 2201, Section 3.12, a Clean Emissions Unit is defined as an emissions unit that is “equipped with an emissions control technology with a minimum control efficiency of at least 95% or is equipped with emission control technology that meets the requirements for achieved-in-practice BACT as accepted by the APCO during the five years immediately prior to the submission of the complete application.

The TEOR operation (S-1246-296) sends casing gas comingled with fluids to front-line tanks and separator vessels equipped with vapor control where the gas is eventually incinerated in approved disposal devices or sent to disposal wells. This method of

incineration and injection reduces VOC emissions by at least 99%, which meets the requirements for achieved-in-practice BACT. Therefore, Baseline Emissions (BE) are equal to the Pre-Project Potential to Emit (PE1).

The PV vent on the crude oil storage tank (S-1246-215) is considered BACT; therefore, the unit meets the definition of a clean emission unit and Baseline Emissions (BE) are equal to the Pre-Project Potential to Emit (PE1).

All steam generators (S-1246-364-0, '-365-0, '-366-0, '-367-0, and '-368-0) are new emissions units and Baseline Emissions (BE) are equal to zero for all pollutants.

Baseline emissions for all units in this project are summarized in the following table:

Baseline Emissions [BE] (lb/year)					
Permit Unit	NO_x	SO_x	PM₁₀	CO	VOC
S-1246-215	0	0	0	0	60,292
S-1246-296	0	0	0	0	213,379
S-1246-364	0	0	0	0	0
S-1246-365	0	0	0	0	0
S-1246-366	0	0	0	0	0
S-1246-367	0	0	0	0	0
S-1246-368	0	0	0	0	0

7. SB 288 Major Modification

This application is a separate "project" from other pending applications submitted by Berry for new steam generators at the same contiguous and adjacent property, as the proposed steam generators are not economically dependent or technically dependent on the installation of the other proposed steam generators. See discussion under 9 – Rule 2410 Prevention of Significant Deterioration Applicability below.

SB 288 Major Modification is defined in 40 CFR Part 51.165 as "any physical change in or change in the method of operation of a major stationary source that would result in a significant net emissions increase of any pollutant subject to regulation under the Act."

Since the fugitive emissions from the TEOR operation are not included in the 28 specific source categories specified in 40 CFR 51.165, the increases in fugitive emissions are not included in the SB 288 Major Modification calculation.

Since this facility is a major source for NO_x, SO_x, PM₁₀, and VOCs the project's PE2 is compared to the SB 288 Major Modification Thresholds in the following table in order to determine if the SB 288 Major Modification calculation is required.

SB 288 Major Modification Thresholds			
Pollutant	Project PE2 ¹ (lb/year)	Threshold (lb/year)	SB 288 Major Modification Calculation Required?
NO _x	29,785	50,000	No
SO _x	18,615	80,000	No
PM ₁₀	20,475	30,000	No
VOC	20,475	50,000	No

¹Project PE2 emissions are equal to the sum of emissions from steam generators S-1246-364-0, '-365-0, '-366-0, '-367-0, and '-368-0.

Since none of the SB 288 Major Modification Thresholds are surpassed with this project, this project does not constitute an SB 288 Major Modification.

8. Federal Major Modification

This application is a separate "project" from other pending applications submitted by Berry for new steam generators at the same contiguous and adjacent property, as the proposed steam generators are not economically dependent or technically dependent on the installation of the other proposed steam generators. See discussion under 9 – Rule 2410 Prevention of Significant Deterioration Applicability below.

District Rule 2201 states that a Federal Major Modification is the same as a "Major Modification" as defined in 40 CFR 51.165 and part D of Title I of the CAA.

Since this source is not included in the 28 specific source categories specified in 40 CFR 51.165, the increases in fugitive emissions associated with this project are not included in the Federal Major Modification determination.

The determination of Federal Major Modification is based on a two-step test. For the first step, only the emission *increases* are counted. Emission decreases may not cancel out the increases for this determination.

Step 1

For new emissions units, the increase in emissions is equal to the PE2 for each new unit included in this project.

The project's combined total emission increases are compared to the Federal Major Modification Thresholds in the following table.

Federal Major Modification Thresholds for Emission Increases			
Pollutant	Total Emissions Increases (lb/yr)	Thresholds (lb/yr)	Federal Major Modification?
NO _x *	29,789	0	Yes
VOC*	18,615	0	Yes
PM ₁₀	24,525	30,000	No
PM _{2.5}	24,525	20,000	Step 2 Required
SO _x	18,615	80,000	No

*If there is any emission increases in NO_x or VOC, this project is a Federal Major Modification and no further analysis is required.

Since there is an increase in NO_x and VOC emissions, this project constitutes a Federal Major Modification, and no further analysis for NO_x and VOC is required.

Since the Federal Major Modification Thresholds have been surpassed for PM_{2.5} emissions, Step 2 is required.

Step 2

The second step includes comparing the total of all related emissions increases and decreases at the facility occurring within the past five years (including those projects not related to the subject project) to determine if the project results in a significant net emission increase and thus a Federal Major Modification. In this calculation, all creditable emission decreases and increases are counted.

Rather than supply the required historical operating data for every emissions change over the past 5 years, the applicant has identified all permit units that are located within all contiguous and adjacent properties within the North Midway Sunset Heavy Oil Federal Major Source. Review of District records has determined that the total PM₁₀ emissions from the Federal Major Source are 116,698 lb-PM₁₀/year (see Appendix H). Therefore, this facility is not a Major Source for PM_{2.5} and this is not a Federal Major Modification for PM_{2.5}.

9. Rule 2410 – Prevention of Significant Deterioration (PSD) Applicability Determination

Rule 2410 applies to pollutants for which the District is in attainment or for unclassified, pollutants. PSD applies to all regulated NSR pollutants, except for those which the District has been classified as non-attainment, and that of those pollutants, the ones emitted from the subject emission units are listed below

- NO₂ (as a primary pollutant)
- SO₂ (as a primary pollutant)
- CO
- PM
- PM₁₀
- Greenhouse gases (GHG): CO₂, N₂O, CH₄, HFCs, PFCs, and SF₆

The first step of this PSD evaluation consists of determining whether the facility is an existing PSD Major Source or not (See Section VII.C.5 of this document).

The facility concedes that it is an existing PSD Major Source.

PSD significant increase determination:

This application is a separate "project" from other pending applications submitted by Berry for new steam generators at the same contiguous and adjacent property, as the proposed steam generators are not economically dependent or technically dependent on the installation of the other proposed steam generators.

The following table lists the budget year, the individual leases, and the proposed year of initial operation of each project:

Steam Generator Projects			
Project Number	Budget Year	Associated lease	Date of initial Operation
S-1111128	2011	Tidewater Lease	ASAP
S-1111978	2013	Fairfield Lease	2013
S-1124502	2014	Belgian Lease	2014

As shown above, although, Berry proposed to install additional proposed steam generators located at the same contiguous property near Derby Acres, each project has a separate budget year, lease, and installation/operating date. Therefore, each was planned and budgeted independently and they are not economically dependent on each other.

Additionally, these distinct projects are not technically dependent on each other, as each steaming activity can occur in the absence of the other.

For the reasons stated above, as the projects are not economically or technically dependent on each other, they are separate projects for purposes of Rule 2410 applicability.

As such, the calculations below include only the subject project.

I. Project Location Relative to Class 1 Area

As demonstrated in the "PSD Major Source Determination" Section above, the facility was determined to be a existing major source for PSD. Because the project is not located within 10 km of a Class 1 area – modeling of the emission increase is not required to determine if the project is subject to the requirements of Rule 2410.

II. Significance of Project Emission Increase

a. Potential to Emit for New or Modified Emission Units

As a screening tool, the potential to emit from all new and modified units is compared to the PSD significant emission increase thresholds, and if total potential to emit from all new and modified units is below this threshold, no further analysis will be needed.

PSD Significant Emission Increase Determination: Potential to Emit¹ (tons/year)						
	NO2	SO2	CO	PM	PM10 ²	CO2e
Total PE from New and Modified Units	14.9	9.4	48.4	10.2	10.2	217,793
PSD Significant Emission Increase Thresholds	40	40	100	25	15	75,000
PSD Significant Emission Increase?	N	N	N	N	N	Y

¹Project PE2 emissions are equal to the sum of emissions from steam generators S-1246-364-0, '-365-0, '-366-0, '-367-0, and '-368-0.

²Assume all PM is PM₁₀

As demonstrated above, because the project has a total potential to emit from all new and modified emission units greater than PSD significant emission increase threshold for CO_{2e}, further analysis is required to determine if the project has an emission increase greater than the PSD significant emission increase threshold for CO_{2e}, see step below.

b. Emission Increase for Each Attainment/Unclassified Pollutant

In this step, the emission increase for each attainment/unclassified pollutant is compared to the PSD significant emission increase thresholds, and if emission increase for each attainment pollutant is below this threshold, no further analysis is needed.

For new emissions units, the increase in emissions is equal to the PE2 for each new unit included in this project.

For existing emissions unit S-1246-296-23, the increase in emissions is calculated as follows:

$$\text{Emission Increase} = \text{PAE} - \text{BAE} - \text{UBC}$$

Where: PAE = Projected Actual Emissions, and
BAE = Baseline Actual Emissions
UBC = Unused baseline capacity

This project does result in an increase in design capacity or potential to emit, and it does not impact the ability of the emission unit to operate at a higher utilization rate, the UBC is the portion of PAE that the emission units could have accommodated during the baseline period. However, the emissions from S-1246-296-23 are fugitive and do not apply.

The project's combined total emission increases are calculated above and compared to the PSD significant emission increase thresholds in the following table.

PSD Significant Emission Increase Determination: Emission Increase (tons/year)	
	CO ₂ e
Emission Increases (only)	217,793
PSD Significant Emission Increase Thresholds	75,000
PSD Significant Emission Increase?	Yes

As demonstrated in the table above, the project emission increases exceed the PSD significant emission increase thresholds for the following pollutant(s): CO₂e. Therefore further analysis is required to determine if the project has a net emission increase greater than the PSD significant emission increase threshold for this specific pollutant.

c. Net emission increase for each attainment pollutant with a significant increase

All creditable emission increases and decreases at the stationary source occurring within the past five years (including those projects not related to the subject project) are calculated to determine if the project results in a significant net emission increase. In this calculation, only creditable emission decreases and increases are counted:

- Emission changes that resulted in the project being a Federal Major Modification (as defined in Rule 2201) or subject to a major PSD permit are not creditable.
- Emission decreases that resulted in the issuance of emission reduction credits are not creditable.

The creditable increases and decreases in emissions during the five years preceding the expected date of commencement of construction of the proposed project must be calculated.

The facility concedes that the project results in a significant net emission increase for CO₂e emissions only. As such, the project is subject to Rule 2410 requirements for CO₂e.

10. Quarterly Net Emissions Change (QNEC)

The QNEC is calculated solely to establish emissions that are used to complete the District's PAS emissions profile screen. Detailed QNEC calculations are included in Appendix I.

VIII. Compliance

Rule 2201 New and Modified Stationary Source Review Rule

A. Best Available Control Technology (BACT)

1. BACT Applicability

BACT requirements are triggered on a pollutant-by-pollutant basis and on an emissions unit-by-emissions unit basis for the following*:

- a. Any new emissions unit with a potential to emit exceeding two pounds per day,
- b. The relocation from one Stationary Source to another of an existing emissions unit with a potential to emit exceeding two pounds per day,
- c. Modifications to an existing emissions unit with a valid Permit to Operate resulting in an AIPE exceeding two pounds per day, and/or
- d. Any new or modified emissions unit, in a stationary source project, which results in an SB288 Major Modification or a Federal Major Modification,

*Except for CO emissions from a new or modified emissions unit at a Stationary Source with an SSPE2 of less than 200,000 pounds per year of CO.

a. New emissions units – PE > 2 lb/day

As seen in Section VII.C.2 of this evaluation, BPC is proposing to install five new steam generators (S-1246-364-0, '-365-0, '-366-0, '-367-0, and '-368-0) with a PE greater than 2 lb/day for NO_x, SO_x, PM₁₀, CO, and VOC.

BACT is triggered for NO_x, SO_x, PM₁₀, CO and VOC because the PEs are greater than 2 lbs/day and the SSPE for CO is greater than 200,000 lb/year.

b. Relocation of emissions units – PE > 2 lb/day

As discussed in Section I above, there are no emissions units being relocated from one stationary source to another; therefore, BACT is not triggered for location of emissions units

c. Modification of emissions units – AIPE > 2 lb/day

$$\text{AIPE} = \text{PE2} - \text{HAPE}$$

Where,

- AIPE = Adjusted Increase in Permitted Emissions, (lb/day)
- PE2 = Post-Project Potential to Emit, (lb/day)
- HAPE = Historically Adjusted Potential to Emit, (lb/day)

$$\text{HAPE} = \text{PE1} \times (\text{EF2}/\text{EF1})$$

Where,

- PE1 = The emissions unit's Potential to Emit prior to modification or relocation, (lb/day)
- EF2 = The emissions unit's permitted emission factor for the pollutant after modification or relocation. If EF2 is greater than EF1 then EF2/EF1 shall be set to 1.
- EF1 = The emissions unit's permitted emission factor for the pollutant before the modification or relocation

The emission factors for the TEOR system are not changing, therefore:

$$\text{AIPE} = \text{PE2} - (\text{PE1} * (\text{EF2} / \text{EF1})) \rightarrow \text{AIPE} = \text{PE2} - \text{PE1}$$

S-1246-296:

$$\begin{aligned} \text{AIPE} &= 675.3 - 571.8 \\ &= 103.5 \text{ lb-VOC/day} \end{aligned}$$

As demonstrated above, the AIPE for permit S-1246-296 is greater than 2.0 lb/day for VOC emissions; therefore, BACT is triggered for VOC.

d. SB 288 Major Modification or a Federal Major Modification

As discussed in Section VII.C.7 above, this project does not constitute a SB 288 Major Modification for NO_x, SO_x, PM₁₀, and VOC emissions; therefore, BACT is not triggered for NO_x, SO_x, PM₁₀, and VOC for the steam generators and for VOC for the TEOR system.

As discussed in Section VII.C.8 above, this project does constitute a Federal Major Modification for NO_x and VOC emissions; therefore, BACT is triggered for NO_x and VOC for the steam generators and for VOC for the TEOR system.

2. BACT Guideline

BACT Guideline 7.1.1, applies to thermally enhanced oil recovery – steam drive oil wells (See Appendix B).

Please note that BACT Guideline 1.2.1 [Steam Generator (≥ 5 MMBtu/hr, Oilfield)] has been rescinded. The NO_x emission limit requirement of District Rule 4320 is lower than the Achieved-in-Practice requirement of BACT Guideline 1.2.1 (14 ppmv @ 3% O₂); therefore, a project specific BACT analysis will be performed to determine BACT for this project. More details regarding this are provided in Appendix C.

3. Top-Down BACT Analysis

Per Permit Services Policies and Procedures for BACT, a Top-Down BACT analysis shall be performed as a part of the application review for each application subject to the BACT requirements pursuant to the District's NSR Rule.

Pursuant to the attached Top-Down BACT Analysis (see Appendix C), BACT has been satisfied with the following:

TEOR System (S-1246-296):

VOC: Vapor control system and inspection and maintenance program with noncondensables incinerated at a steam generator or incinerator and re-injection to formation.

Steam Generators (S-1246-364-0, '-365-0, '-366-0, '-367-0, and '-368-0):

NO_x: 7 ppmvd @ 3% O₂
 SO_x: Natural gas treated to remove 95% by weight of sulfur compounds
 PM₁₀: Natural gas treated to remove 95% by weight of sulfur compounds
 CO: 35 ppmvd or less @ 3% O₂
 VOC: Gaseous fuel

B. Offsets

1. Offset Applicability

Pursuant to Section 4.5.3, offset requirements shall be triggered on a pollutant by pollutant basis and shall be required if the Post Project Stationary Source Potential to Emit (SSPE2) equals to or exceeds the offset threshold levels in Table 4-1 of Rule 2201.

The following table compares the post-project facility-wide annual emissions in order to determine if offsets will be required for this project.

Offset Determination (lb/year)					
	NO _x	SO _x	PM ₁₀	CO	VOC
Post Project SSPE (SSPE2)	>20,000	>54,750	>29,200	>200,000	>20,000
Offset Threshold	20,000	54,750	29,200	200,000	20,000
Offsets triggered?	Yes	Yes	Yes	Yes	Yes

2. Quantity of Offsets Required

As seen above, the facility is an existing Major Source for NO_x, SO_x, PM₁₀, CO, VOC, and the SSPE2 is greater than the offset thresholds for these pollutants; therefore, offset calculations will be required for this project.

However, Section 4.6.1 of Rule 2201 states that emissions offsets are not required for increases in CO in attainment areas provided the applicant demonstrates to the satisfaction of the APCO that the Ambient Air Quality (AAQ) Standards are not violated in the areas to be affected, such emissions will be consistent with Reasonable Further Progress, and will not cause or contribute to a violation of AAQ Standards. The District performed an AAQ Analysis and determined that this project will not result in or contribute to a violation of an AAQ Standard for CO (see Appendix D). Therefore, CO offsets are not required for this project.

Per Sections 4.7.1 and 4.7.3, the quantity of offsets in pounds per year is calculated as follows for sources with an SSPE1 greater than the offset threshold levels before implementing the project being evaluated.

Offsets Required (lb/year) = $(\sum[PE2 - BE] + ICCE) \times DOR$, for all new or modified emissions units in the project,

Where,

PE2 = Post Project Potential to Emit, (lb/year)

BE = Baseline Emissions, (lb/year)

ICCE = Increase in Cargo Carrier Emissions, (lb/year)

DOR = Distance Offset Ratio, determined pursuant to Section 4.8

BE = Pre-project Potential to Emit for:

- Any unit located at a non-Major Source,
- Any Highly-Utilized Emissions Unit, located at a Major Source,
- Any Fully-Offset Emissions Unit, located at a Major Source, or
- Any Clean Emissions Unit, Located at a Major Source.

otherwise,

BE = Historic Actual Emissions (HAE)

There are no increases in cargo carrier emissions; therefore offsets can be determined as follows: Offsets required (lb/year) = $([PE2 - BE] + ICCE) \times DOR$

Permit No.	Post Project Potential to Emit [PE2] (lb/ yr)			
	NO _x	SO _x	PM ₁₀	VOC
S-1246-215	0	0	0	0
S-1246-296	0	0	0	251,156
S-1246-364	5,957	3,723	4,905	4,095
S-1246-365	5,957	3,723	4,905	4,095
S-1246-366	5,957	3,723	4,905	4,095
S-1246-367	5,957	3,723	4,905	4,095
S-1246-368	5,957	3,723	4,905	4,095

Permit No.	Baseline Emissions [BE] (lb/yr)			
	NO _x	SO _x	PM ₁₀	VOC
S-1246-215	0	0	0	60,292
S-1246-296	0	0	0	213,379
S-1246-364	0	0	0	0
S-1246-365	0	0	0	0
S-1246-366	0	0	0	0
S-1246-367	0	0	0	0
S-1246-368	0	0	0	0

Permit No.	Offsets Required [PE2 - BE] (lb/yr)			
	NO _x	SO _x	PM ₁₀	VOC
S-1246-215	0	0	0	-60,292
S-1246-296	0	0	0	37,779
S-1246-364	5,957	3,723	4,905	4,095
S-1246-365	5,957	3,723	4,905	4,095
S-1246-366	5,957	3,723	4,905	4,095
S-1246-367	5,957	3,723	4,905	4,095
S-1246-368	5,957	3,723	4,905	4,095
Total	29,785	18,615	24,525	-2,308

As demonstrated in the preceding tables:

- NO_x, SO_x, and PM₁₀ offsets are required
- CO offsets are not required (no violation of an Ambient Air Quality Standard)
- VOC offsets are not required (increases are mitigated by the shutdown of the tank listed on S-1246-210)

NO_x

Since this project results in a Federal Major Modification for NO_x the distance offset ratio (DOR) for these pollutants will be equal to 1.5 (per Rule 2201, Section 4.8.1). BPC has proposed the following ERCs:

	1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter
ERC #S-3970-2	31,140	31,140	31,140	31,140
DOR	1.5 (Federal Major Modification)			
Prior reservations	13,404	13,404	13,404	13,404

Total Offsets Required (at 1.5:1 distance offset ratio):

Permit No.	NO _x Offsets Required (lb/qtr)			
	1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter
S-1246-364	2,234	2,234	2,234	2,234
S-1246-365	2,234	2,234	2,234	2,234
S-1246-366	2,234	2,234	2,234	2,234
S-1246-367	2,234	2,234	2,234	2,234
S-1246-368	2,234	2,234	2,234	2,234
Total	11,170	11,170	11,170	11,170

Offsets Reserved in PAS (at discussed offset ratios):

	1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter
ERC #S-3970-2	11,170	11,170	11,170	11,170
Total:	11,170	11,170	11,170	11,170

As seen above, BPC has sufficient NO_x credits to fully offset the quarterly NO_x emissions increases associated with this project.

SO_x:

BPC has proposed the following ERCs:

	1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter
ERC #S-3917-5 (available)	51,750	52,166	51,970	53,291
Generated at:	Facility S-1637; NE ¼ of Section 6, T30S, R26E			
DOR	1.5 (>15 miles)			
Prior reservations	24,884	24,885	24,885	24,885

Total Offsets Required (at 1.5:1 distance offset ratio):

Permit No.	SO _x Offsets Required (lb/qtr)			
	1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter
S-1246-364	1396	1396	1396	1396
S-1246-365	1396	1396	1396	1396
S-1246-366	1396	1396	1396	1396
S-1246-367	1396	1396	1396	1396
S-1246-368	1396	1396	1396	1396
Total	6980	6980	6980	6980

Offsets Reserved in PAS (at discussed offset ratios):

	1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter
ERC #S-3917-5	6980	6980	6980	6980
Total:	6980	6980	6980	6980

As seen above, BPC has sufficient SO_x credits to fully offset the quarterly SO_x emissions increases associated with this project.

PM₁₀:

BPC has proposed using SO_x ERCs to offset the increases in PM₁₀.

Interpollutant offset ratios for trades between SO_x and PM₁₀ are allowed pursuant to Rule 2201, Section 4.13.3.1.2. An interpollutant ratio of 1.0:1 for SO_x to PM₁₀ will be applied.

BPC has proposed the following ERCs:

	1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter
ERC #S-3917-5	51,750	52,166	51,970	53,291
Reserved for this project (SO _x offset)	6980	6980	6980	6980
Generated at:	Facility S-1637; NE ¼ of Section 6, T30S, R26E			
DOR	1.5 (>15 miles)			
Prior reservations	24,884	24,885	24,885	24,885

Total Offsets Required (at 1.5:1 distance offset ratio):

Permit No.	PM ₁₀ Offsets Required (lb/qtr)			
	1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter
S-1246-364	1536	1536	1536	1536
S-1246-365	1536	1536	1536	1536
S-1246-366	1536	1536	1536	1536
S-1246-367	1536	1536	1536	1536
S-1246-368	1536	1536	1536	1536
Total	7680	7680	7680	7680

Offsets Reserved in PAS (at discussed offset ratios):

	1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter
ERC #S-3665-5	7680	7680	7680	7680
Total:	7680	7680	7680	7680

As seen above, BPC has sufficient SO_x credits to fully offset the quarterly PM₁₀ emissions increases associated with this project.

Proposed Rule 2201 (offset) Conditions:

S-1246-296:

- Within 90 days of startup of the equipment authorized by this Authority to Construct, Permit to Operate S-1246-215 shall be surrendered to the District and the associated equipment shall be removed or rendered inoperable. [District Rule 2201]

S-1246-364-0, '-365-0, '-366-0, '-367-0, and '-368-0:

- Within 90 days of startup of the equipment authorized by this Authority to Construct, Permit to Operate S-1246-215 shall be surrendered to the District and the associated equipment shall be removed or rendered inoperable. [District Rule 2201]
- {GC# 4447 - edited} Prior to operating equipment under this Authority to Construct, permittee shall surrender NO_x emission reduction credits for the following quantity of emissions: 1st quarter – 2,234 lb, 2nd quarter - 2,234 lb, 3rd quarter - 2,234 lb, and fourth quarter - 2,234 lb. These amounts include the applicable offset ratio specified in Rule 2201 Section 4.8 (as amended 4/21/11) for the ERC specified below. [District Rule 2201]
- {GC# 4447 - edited} Prior to operating equipment under this Authority to Construct, permittee shall surrender SO_x emission reduction credits for the following quantity of emissions: 1st quarter – 2932 lb, 2nd quarter – 2932 lb, 3rd quarter – 2932 lb, and fourth quarter – 2932 lb. These amounts include the applicable offset ratio specified in Rule 2201 Section 4.8 (as amended 4/21/11) for the ERC specified below. [District Rule 2201]
- {GC# 1983} ERC Certificate Numbers S-3970-2 and S-3917-5, (or certificates split from these certificates) shall be used to supply the required offsets, unless a revised offsetting proposal is received and approved by the District, upon which this Authority to Construct shall be reissued, administratively specifying the new offsetting proposal. Original public noticing requirements, if any, shall be duplicated prior to reissuance of this Authority to Construct. [District Rule 2201]

C. Public Notification

1. Applicability

Public noticing is required for:

- a. New Major Sources, Federal Major Modifications, and SB288 Major Modifications,
- b. Any new emissions unit with a Potential to Emit greater than 100 pounds during any one day for any one pollutant,
- c. Any project which results in the offset thresholds being surpassed, and/or
- d. Any project with an SSIPE of greater than 20,000 lb/year for any pollutant.

a. New Major Sources, Federal Major Modifications, and SB288 Major Modifications

New Major Sources are new facilities, which are also Major Sources. Since this is not a new facility, public noticing is not required for this project for New Major Source purposes.

As demonstrated in VII.C.7, this project does not constitute a SB 288 Major Modification; therefore, public noticing for SB 288 purposes is not required.

As demonstrated in VII.C.8, this project is a Federal Major Modification; therefore, public noticing for Federal Major Modification purposes is required.

b. PE > 100 lb/day

Applications which include a new emissions unit with a Potential to Emit greater than 100 pounds during any one day for any pollutant will trigger public noticing requirements. As seen in Section VII.C.2 above, this project does not include a new emissions unit which has daily emissions greater than 100 lb/day for any pollutant; therefore public noticing for PE > 100 lb/day purposes is not required.

c. Offset Threshold

The following table compares the SSPE1 with the SSPE2 in order to determine if any offset thresholds have been surpassed with this project.

Offset Threshold				
Pollutant	SSPE1 (lb/year)	SSPE2 (lb/year)	Offset Threshold	Public Notice Required?
NO _x	>20,000	>20,000	20,000 lb/year	No
SO _x	>54,750	>54,750	54,750 lb/year	No
PM ₁₀	>29,200	>29,200	29,200 lb/year	No
CO	>200,000	>200,000	200,000 lb/year	No
VOC	>20,000	>20,000	20,000 lb/year	No

As detailed above, there were no thresholds surpassed with this project; therefore public noticing is not required for offset purposes.

d. SSIPE > 20,000 lb/year

Public notification is required for any permitting action that results in a Stationary Source Increase in Permitted Emissions (SSIPE) of more than 20,000 lb/year of any affected pollutant. According to District policy, the SSIPE is calculated as the Post Project Stationary Source Potential to Emit (SSPE2) minus the Pre-Project Stationary Source Potential to Emit (SSPE1), i.e. SSIPE = SSPE2 – SSPE1. The values for SSPE2 and SSPE1 are calculated according to Rule 2201, Sections 4.9 and 4.10, respectively. The SSIPE is compared to the SSIPE Public Notice thresholds in the following table:

Stationary Source Increase in Permitted Emissions [SSIPE] – Public Notice					
Pollutant	PE2 (lb/year)	PE1 (lb/year)	SSIPE (lb/year)	SSIPE Public Notice Threshold	Public Notice Required?
NO _x	29,785	0	29,785	20,000 lb/year	Yes
SO _x	18,615	0	18,615	20,000 lb/year	No
PM ₁₀	24,525	0	24,525	20,000 lb/year	Yes
CO	24,525	0	24,525	20,000 lb/year	Yes
VOC	304,738	306,777	-2308	20,000 lb/year	No

As demonstrated above, the SSIPEs for NO_x, SO_x, PM₁₀, and CO were greater than 20,000 lb/year; therefore public noticing for SSIPE purposes is required.

2. Public Notice Action

As discussed above, public noticing is required for Federal Major Modification, and SSIPE>20,000 lb/year purposes. Therefore, public notice documents will be submitted to the California Air Resources Board (CARB) and a public notice will be published in a local newspaper of general circulation prior to the issuance of the ATC for this equipment.

D. Daily Emission Limits (DELs)

Daily Emissions Limitations (DELs) and other enforceable conditions are required by Section 3.15 to restrict a unit's maximum daily emissions, to a level at or below the emissions associated with the maximum design capacity. Per Sections 3.15.1 and 3.15.2, the DEL must be contained in the latest ATC and contained in or enforced by the latest PTO and enforceable, in a practicable manner, on a daily basis. DELs are also required to enforce the applicability of BACT.

S-1246-296 (existing TEOR System):

- Fugitive VOC emissions rate for the TEOR operation, calculated using CAPCOA California Implementation Guidelines for Estimating Mass Emissions of Fugitive Hydrocarbon Leaks at Petroleum Facilities, Table IV-2c, Oil and Gas Production Screening Value Ranges Emission Factors (Feb 1999) and the total number of components in gas/light liquid service, shall not exceed 688.1 lb-VOC/day. [District Rule 2201]

S-1246-364, '-365, '-366, '-367, and '-369 (New Steam Generators):

- This unit shall be fired on natural gas or ethane-rich natural gas with a sulfur content that does not exceed 1 gr of sulfur compounds (as S) per 100 scf. [District Rules 2201 and 4320]
- Except for periods of startup and shutdown, emissions from the natural gas-fired unit shall not exceed any of the following limits: 7 ppmvd NOx @ 3% O2 or 0.008 lb-NOx/MMBtu, 0.0055 lb-PM10/MMBtu, 35 ppmvd CO @ 3% O2 or 0.026 lb-CO/MMBtu, or 0.0055 lb-VOC/MMBtu. [District Rules 2201, 4201, 4301, 4305, 4306, 4320, and 4801]

E. Compliance Assurance

1. Source Testing

Pursuant to District Policy APR 1705, source testing the TEOR system is not required to demonstrate compliance with Rule 2201.

These steam generators are subject to District Rule 4305, *Boilers, Steam Generators and Process Heaters, Phase 2*, District Rule 4306, *Boilers, Steam Generators and Process Heaters, Phase 3*, and District Rule 4320, *Advanced Emission Reduction Options for Boilers, Steam Generators, and Process Heaters Greater than 5 MMBtu/hr*. Source testing requirements, in accordance with these rules will be discussed in Section VIII of this evaluation.

2. Monitoring

No additional monitoring of the TEOR system is required to demonstrate compliance with Rule 2201.

These steam generators are subject to District Rule 4305, *Boilers, Steam Generators and Process Heaters, Phase 2*, District Rule 4306, *Boilers, Steam Generators and Process Heaters, Phase 3*, and District Rule 4320, *Advanced Emission Reduction Options for Boilers, Steam Generators, and Process Heaters Greater than 5 MMBtu/hr*. Monitoring requirements, in accordance with these rules will be discussed in Section VIII of this evaluation.

3. Recordkeeping

No additional recordkeeping of the TEOR system is required to demonstrate compliance with Rule 2201.

These steam generators are subject to District Rule 4305, *Boilers, Steam Generators and Process Heaters, Phase 2*, District Rule 4306, *Boilers, Steam Generators and Process Heaters, Phase 3*, and District Rule 4320, *Advanced Emission Reduction Options for Boilers, Steam Generators, and Process Heaters Greater than 5 MMBtu/hr*. Recordkeeping, in accordance with these rules will be discussed in Section VIII of this evaluation.

4. Reporting

No reporting is required to demonstrate compliance with Rule 2201.

F. Ambient Air Quality Analysis

Section 4.6.1 of this rule states that emissions offsets are not required for increases in carbon monoxide in attainment areas provided the applicant demonstrates to the satisfaction of the APCO that the Ambient Air Quality Standards are not violated in the areas to be affected, such emissions will be consistent with Reasonable Further Progress, and will not cause or contribute to a violation of Ambient Air Quality Standards.

Section 4.14.1 of this Rule requires that an ambient air quality analysis (AAQA) be conducted for the purpose of determining whether a new or modified Stationary Source will cause or make worse a violation of an air quality standard.

The proposed location is in an attainment area for NO_x, CO, and SO_x. The proposed location is in a non-attainment area for PM₁₀. The increase in criteria pollutants due to the proposed equipment will not cause a violation as shown on the table below titled "Criteria pollutant Modeling Results".

Criteria Pollutant Modeling Results*

Diesel ICE	1 Hour	3 Hours	8 Hours.	24 Hours	Annual
CO	Pass	X	Pass	X	X
NO _x	Pass ¹	X	X	X	Pass
SO _x	Pass	Pass	X	Pass	Pass
PM ₁₀	X	X	X	Pass ²	Pass ²
PM _{2.5}	X	X	X	Pass ²	Pass ²

*Results were taken from the attached PSD spreadsheet.

¹The project was compared to the 1-hour NO₂ National Ambient Air Quality Standard that became effective on April 12, 2010 using the District's approved procedures.

²The criteria pollutants are below EPA's level of significance as found in 40 CFR Part 51.165 (b)(2).

As shown, the calculated contribution of CO, NO_x, SO_x, PM₁₀, and PM_{2.5}, will not exceed the EPA significance level. This project is not expected to cause or make worse a violation of an air quality standard. See Appendix C of this document for the AAQA summary sheet.

G. Compliance Certification

Section 4.15.2 of this Rule requires the owner of a new Major Source or a source undergoing a Title I Modification to demonstrate to the satisfaction of the District that all other Major Sources owned by such person and operating in California are in compliance or are on a schedule for compliance with all applicable emission limitations and standards. As discussed in Sections VIII-Rule 2201-C.1.a and VIII-Rule 2201-C.1.b, this facility is a new major source and this project does constitute a Title I modification, therefore this requirement is applicable. Included in Appendix E is BPC's Statewide Compliance Statement.

H. Alternate Siting Analysis

The current project occurs at an existing facility. The applicant proposes to install five new steam generators and up to 235 new TEOR wells with associated components.

Since the project will provide steam for injection into wells at a nearby location, the existing site will result in the least possible impact from the project. Alternative sites would involve the relocation and/or construction of various support structures on a much greater scale, and would therefore result in a much greater impact.

Rule 2410 Prevention of Significant Deterioration

As demonstrated in Section VII C 9 above, the project is subject to the requirements of Rule 2410 for GHGs (as CO₂e).

Below is a listing of the requirements of Rule 2410, and demonstration that compliance with the requirements is expected.

A. Best Available Control Technology (BACT)

GHG emissions

Currently, there is no BACT CO₂E Guideline for a Steam Generator > 5 MMBtu/hr, Oilfield. However, the District has created a draft Top-Down Steam Generator Rule 2410 BACT Analysis for GHGS. (See Attachment C)

BACT for GHGs has been satisfied with the following:

CO₂e: A convection section with at least 235 square feet of convection section per MMBtu/hr of maximum rated heat input (as verified by the manufacturer)

And

Variable frequency drive high efficiency electrical motors driving the blower and water pump

Currently, there is no BACT CO₂E Guideline for Thermally Enhanced Oil Recovery – Steam Drive Wells. However, the District has created a project specific draft Top-Down Thermally Enhanced Oil Recovery – Steam Drive Wells, Rule 2410 BACT Analysis for GHGS. (See Attachment IX)

BACT for GHGs has been satisfied with the following:

CO₂e: Minimizing fugitive GHG emissions by applying leak standards and I&M requirements to components subject to Rule 4401 requirements

B. Ambient air quality impact analysis

40 CFR 52.21(k) (as referenced in Rule 2410) requires that applications with significant emission increases would not cause or contribute to a violation of and Federal Ambient air quality standard or any applicable maximum allowable increase over baseline concentration (increment consumption).

EPA's March 2011 guidance titled "PSD and Title V Permitting Guidance for Greenhouse Gases" (pages 47 and 48) states that because there are no ambient air quality standards for GHGs that EPA does not recommend that sources be required to model the impacts of GHG emissions due to a project.

The District concurs with this recommendation. Therefore, no modeling of GHG emission increases is required.

C. Ambient air quality monitoring,

40 CFR 52.21(m) (as referenced in Rule 2410) requires that applications with significant emission increases contain an analysis of air ambient air quality in the area that the project would affect, i.e. ambient air quality monitoring.

EPA's March 2011 guidance titled "PSD and Title V Permitting Guidance for Greenhouse Gases" (pages 47 and 48) states that there is an exemption from ambient air quality monitoring in 40 CFR 52.(i)(5)(iii) for pollutants for which there is not an ambient air quality standard (AAQS), i.e. GHGs. Additionally, notwithstanding the provisions of 40 CFR 52.21.(m)(1)(i) that allows the Administrator to require ambient air monitoring for pollutants for which an AAQS does not exist, EPA does not consider it necessary or appropriate for applicants to perform ambient monitoring of GHGs.

The District concurs with this recommendation. Therefore, no ambient monitoring of GHGs is required.

D. Additional impact analyses, including visibility, soils, vegetation

40 CFR 52.21(o) (as referenced in Rule 2410) requires that applications prepare an analysis on the impairment to visibility, soils, and vegetation that would occur as a result of the proposed modification and the general commercial, residential, industrial, or other growth associated with the project.

EPA's March 2011 guidance titled "PSD and Title V Permitting Guidance for Greenhouse Gases" (pages 47 and 48) states that it is not necessary for applicants to assess impacts due to GHG emission increases as there is no method to quantify project level on visibility, soils, and vegetation. The only modeling techniques available for emission increases several orders of magnitude greater than project level emission increases.

The District concurs with this recommendation. Therefore, no additional impact analysis for visibility, soils, vegetation or other related growth is required.

E. Public noticing requirements

District Rule 2410 requires the preliminary decision on the project must undergo a 30-day public notification process prior to issuance of ATC(s) and notification of the preliminary decision shall be mailed to the required regulatory agencies.

The notice shall state the emissions change, there is no increment consumption associated with this project. The notice will include the ability for the public to make a request for a public hearing.

Compliance with this Rule is expected.

Rule 2520 Federally Mandated Operating Permits

This facility is subject to this Rule, and has received their Title V Operating Permit. Section 3.29 defines a significant permit modification as a "permit amendment that does not qualify as a minor permit modification or administrative amendment."

As discussed above, the facility has applied for a Certificate of Conformity (COC); therefore, the facility must apply to modify their Title V permit with an administrative amendment, prior to operating with the proposed modifications. Continued compliance with this rule is expected. The facility may construct/operate under the ATC upon submittal of the Title V administrative amendment/minor modification application.

Rule 4001 New Source Performance Standards (NSPS)

This rule incorporates NSPS from Part 60, Chapter 1, Title 40, Code of Federal Regulations (CFR); and applies to all new sources of air pollution and modifications of existing sources of air pollution listed in 40 CFR Part 60.

TEOR System S-1246-296

There are no subparts of 40 CFR 60 that apply to TEOR systems. Therefore, the TEOR unit in this project is not subject to Rule 4001.

Steam Generator S-1246-364-0, '-365-0, '-366-0, '-367-0, and '-368-0

40 CFR Part 60, Subpart Dc applies to Small Industrial-Commercial-Industrial Steam Generators between 10 MMBtu/hr and 100 MMBtu/hr (post-6/9/89 construction, modification or, reconstruction)

This steam generator has a rating of 85 MMBtu/hr and is fired on natural gas. Subpart Dc has no standards for gas-fired steam generators. Therefore subpart Dc does not apply.

Rule 4101 Visible Emissions

Per Section 5.0, no person shall discharge into the atmosphere emissions of any air contaminant aggregating more than 3 minutes in any hour which is as dark as or darker than Ringelmann 1 (or 20% opacity). As the steam generators are fired solely on natural gas and the TEOR system will result in fugitive emissions only, visible emissions are not expected to exceed Ringelmann 1 or 20% opacity. The following condition will remain listed on the facility-wide permit to ensure compliance:

- No air contaminants shall be discharged into the atmosphere for a period or periods aggregating more than 3 minutes in any one hour which is as dark or darker than Ringelmann #1 or equivalent to 20% opacity and greater, unless specifically exempted by District Rule 4101 (11/15/01). If the equipment or operation is subject to a more stringent visible emission standard as prescribed in a permit condition, the more stringent visible emission limit shall supersede this condition. [District Rule 4101]

Rule 4102 Nuisance

Section 4.0 prohibits discharge of air contaminants which could cause injury, detriment, nuisance or annoyance to the public. Public nuisance conditions are not expected as a result of these operations, provided the equipment is well maintained. Therefore, compliance with this rule is expected. This facility-wide permit for BPC contains the following condition:

- No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]

California Health & Safety Code 41700 (Health Risk Assessment)

District Policy APR 1905 – Risk Management Policy for Permitting New and Modified Sources specifies that for an increase in emissions associated with a proposed new source or modification, the District perform an analysis to determine the possible impact to the nearest resident or worksite.

An HRA is not required for a project with a total facility prioritization score of less than one. According to the Technical Services Memo for this project (Appendix D), the total facility prioritization score including this project was greater than one. Therefore, a health risk assessment was required to determine the short-term acute and long-term chronic exposure from this project.

The cancer risk for this project is shown below:

HRA Summary		
Unit	Cancer Risk	T-BACT Required
S-1246-296-23	0.12 per million	No
S-1246-364-0	0.0 per million	No
S-1246-365-0	0.0 per million	No
S-1246-366-0	0.0 per million	No
S-1246-367-0	0.0 per million	No
S-1246-368-0	0.0 per million	No

Discussion of T-BACT

BACT for toxic emission control (T-BACT) is required if the cancer risk exceeds one in one million. As demonstrated above, T-BACT is not required for this project because the HRA indicates that the risk is not above the District's thresholds for triggering T-BACT requirements; therefore, compliance with the District's Risk Management Policy is expected.

Rule 4201 Particulate Matter Concentration

Section 3.1 prohibits discharge of dust, fumes, or total particulate matter into the atmosphere from any single source operation in excess of 0.1 grain per dry standard cubic foot.

F-Factor for NG: 8,578 dscf/MMBtu at 60 °F
 PM10 Emission Factor: 0.005 lb-PM10/MMBtu
 Percentage of PM as PM10 in Exhaust: 100%
 Exhaust Oxygen (O₂) Concentration: 3%
 Excess Air Correction to F Factor = $20.9 / (20.9 - 3) = 1.17$

$$GL = \left(\frac{0.0055 \text{ lb} - PM}{MMBtu} \right) * \left(\frac{7,000 \text{ grain}}{\text{lb} - PM} \right) / \left(\frac{8,578 \text{ ft}^3}{MMBtu} * 1.17 \right)$$

$$GL = 0.004 \text{ grain/dscf} < 0.1 \text{ grain/dscf}$$

Therefore, compliance with District Rule 4201 requirements is expected. Additionally, particulate matter emissions from the steam generator is already limited by Rule 2201 to a value less than or equal to the rule limit of 0.1 grain per cubic foot of gas at dry standard conditions. Therefore the following condition, previously discussed, will ensure compliance with this rule:

- Except for periods of startup and shutdown, emissions from the natural gas-fired unit shall not exceed any of the following limits: 7 ppmvd NOx @ 3% O2 or 0.008 lb-NOx/MMBtu, 0.0055 lb-PM10/MMBtu, 35 ppmvd CO @ 3% O2 or 0.026 lb-CO/MMBtu, or 0.0055 lb-VOC/MMBtu. [District Rules 2201, 4201, 4301, 4305, 4306, 4320, and 4801]

Rule 4301 Fuel Burning Equipment

This rule specifies maximum emission rates in lb/hr for SO₂, NO₂, and combustion contaminants (defined as total PM in Rule 1020). This rule also limits combustion contaminants to ≤ 0.1 gr/scf. According to AP 42 (Table 1.4-2, footnote c), all PM emissions from natural gas combustion are less than 1 μm in diameter.

District Rule 4301 Limits (lb/hr)			
Pollutant	NO ₂	Total PM	SO ₂
All Steam Generators	0.68	0.47	0.43
Rule Limit (lb/hr)	140	10	200

The above table indicates compliance with the maximum lb/hr emissions in this rule; therefore, the following condition, previously discussed, will ensure compliance with this rule:

- Except for periods of startup and shutdown, emissions from the natural gas-fired unit shall not exceed any of the following limits: 7 ppmvd NOx @ 3% O2 or 0.008 lb-NOx/MMBtu, 0.0055 lb-PM10/MMBtu, 35 ppmvd CO @ 3% O2 or 0.026 lb-CO/MMBtu, or 0.0055 lb-VOC/MMBtu. [District Rules 2201, 4201, 4301, 4305, 4306, 4320, and 4801]
- This unit shall be fired on natural gas or ethane-rich natural gas with a sulfur content that does not exceed 1 gr of sulfur compounds (as S) per 100 scf. [District Rules 2201 and 4320]

Rule 4304 Equipment Tuning Procedure for Boilers, Steam Generators and Process Heaters

This rule provides equipment tuning procedures for boilers, steam generators and process heaters to control visible emissions and emissions of both nitrogen oxides (NOx) and carbon monoxide (CO).

These units follow District approved Alternate Monitoring scheme A, where the applicable emission limits will be periodically monitored for compliance with Rule 4320; therefore, BPC will not be required to perform tuning in accordance with the procedures of this Rule.

Rule 4305 Boilers, Steam Generators and Process Heaters – Phase II

These steam generators are gas-fired with a maximum heat input of 85 MMBtu/hr. Pursuant to Section 2.0 of District Rule 4305, the unit is subject to District Rule 4305, *Boilers, Steam Generators and Process Heaters – Phase 2*.

In addition, these units are also subject to District Rule 4306, *Boilers, Steam Generators and Process Heaters – Phase 3*.

Since the emissions limits of District Rule 4306 and all other requirements are equivalent or more stringent than District Rule 4305 requirements, compliance with District Rule 4306 requirements will satisfy the requirements of District Rule 4305.

Rule 4306 Boilers, Steam Generators and Process Heaters – Phase III

These steam generators are gas-fired with a maximum heat input of 85 MMBtu/hr. Pursuant to Section 2.0 of District Rule 4306, the unit is subject to District Rule 4306.

In addition, these units are also subject to *District Rule 4320, Advanced Emission Reduction Options for Boilers, Steam Generators, and Process Heaters Greater than 5 MMBtu/hr*.

Since the emissions limits of District Rule 4320 and all other requirements are equivalent or more stringent than District Rule 4306 requirements, compliance with District Rule 4320 requirements will satisfy the requirements of District Rule 4306.

Rule 4320 Advanced Emission Reduction Options for Boilers, Steam Generators, and Process Heaters Greater than 5.0 MMBtu/hr

This rule limits NO_x, CO, SO₂ and PM₁₀ emissions from boilers, steam generators and process heaters rated greater than 5 MMBtu/hr. This rule also provides a compliance option of payment of fees in proportion to the actual amount of NO_x emitted over the previous year.

These steam generators are rated at greater than 5 MMBtu/hr heat input. Therefore this rule applies.

Section 5.1 NO_x Emission Limits

Section 5.1 states that an operator of a unit(s) subject to this rule shall comply with all applicable requirements of the rule and one of the following, on a unit-by-unit basis:

- Operate the unit to comply with the emission limits specified in Sections 5.2 and 5.4; or
- Pay an annual emissions fee to the District as specified in Section 5.3 and comply with the control requirements specified in Section 5.4; or
- Comply with the applicable Low-use Unit requirements of Section 5.5.

Section 5.2.1 states that on and after the indicated Compliance Deadline units shall not be operated in a manner which exceeds the applicable NO_x limit specified in Table 1 of this rule.

This unit is fired on >50% PUC quality gas and has a maximum heat input of 85.0 MMBtu/hr; therefore, the applicable emission limit category Section 5.2, Table 1, Category C.2.a from District Rule 4320 applies as follows:

C. Oilfield Steam Generators			
Category	NO _x Limit	Authority to Construct	Compliance Deadline
2. Units with a total rated heat input >20.0 MMBtu/hr	a) Standard Schedule 7 ppmv or 0.008 lb/MMBtu; or	July 1, 2009	July 1, 2010
	b) Staged Enhanced Schedule Initial Limit 9 ppmv or 0.011 lb/MMBtu; and	July 1, 2011	July 1, 2012
	Final Limit 5 ppmv or 0.0062 lb/MMBtu	January 1, 2013	January 1, 2014

BPC has proposed to comply with Rule 4320 by limiting the burner to 7 ppm-NO_x @ 3% O₂ (or 0.008 lb-NO_x/MMBtu). The following condition will be listed on the ATC to ensure compliance:

- Except for periods of startup and shutdown, emissions from the natural gas-fired unit shall not exceed any of the following limits: 7 ppmvd NO_x @ 3% O₂ or 0.008 lb-NO_x/MMBtu, 0.005 lb-PM10/MMBtu, 35 ppmvd CO @ 3% O₂ or 0.026 lb-CO/MMBtu, or 0.0055 lb-VOC/MMBtu. [District Rules 2201, 4201, 4301, 4305, 4306, 4320, and 4801]

Section 5.4 Particulate Matter Control Requirements

5.4.1 To limit particulate matter emissions, an operator shall comply with one of the following requirements:

5.4.1.1 On and after the applicable NO_x Compliance Deadline specified in Section 5.2 Table 1, operators shall fire units exclusively on PUC-quality natural gas, commercial propane, butane, or liquefied petroleum gas, or a combination of such gases;

5.4.1.2 On and after the applicable NO_x Compliance Deadline specified in Section 5.2 Table 1, operators shall limit fuel sulfur content to no more than five (5) grains of total sulfur per one hundred (100) standard cubic feet; or

5.4.1.3 On and after the applicable NO_x Compliance Deadline specified in Section 5.2 Table 1, operators shall install and properly operate an emission control system that reduces SO₂ emissions by at least 95% by weight; or limit exhaust SO₂ to less than or equal to 9 ppmv corrected to 3.0% O₂.

5.4.1.4 Notwithstanding the compliance deadlines indicated in Sections 5.4.1.1 through 5.4.1.3, refinery units, which require modification of refinery equipment

to reduce sulfur emissions, shall be in compliance with the applicable requirement in Section 5.4.1 no later than July 1, 2013.

BPC will address the particulate matter by limiting the fuel sulfur content to 1 gr-S/100 dscf (previously proposed in the Rule 2201 compliance section VIII.D):

- The unit shall only be fired on natural/TEOR/ethane rich gas with a maximum sulfur content of 1 gr S/100scf. [District Rules 2201, 4301, and 4320]
- The higher heating value of each non-certified fuel shall be certified by a third party fuel supplier or determined by ASTM D1826 or D1945 in conjunction with ASTM D 3588. [District Rules 2201 and 4320]

Compliance with section 5.4 is expected.

Section 5.6 Startup and Shutdown Provisions

Section 5.6 states that on and after the full compliance deadline specified in Section 5.0, the applicable emission limits of Sections 5.2 Table 1 and 5.5.2 shall not apply during start-up or shutdown provided an operator complies with the requirements specified in Sections 5.6.1 through 5.6.5.

Emissions during start-up and shutdown will not be subject to the emission limits in Sections 5.2 and 5.2.2. The following conditions will be listed on the ATC:

- Duration of start-up or shutdown shall not exceed two hours each per occurrence. During start-up or shutdown, the emissions control system shall be in operation, and emissions shall be minimized insofar as technologically possible. The operator shall maintain daily records of the duration of start-up and shutdown periods. [District Rules 4305, 4306, and 4320]
- Start-up is defined as the period of time during which a unit is brought from a shutdown status to its operating temperature and pressure, including the time required by the unit's emission control system to reach full operation. Shutdown is defined as the period of time during which a unit is taken from an operational to a non-operational status by allowing it to cool down from its operating temperature to ambient temperature as the fuel supply to the unit is completely turned off. [District Rules 4305, 4306, and 4320]

Section 5.7 Monitoring Provisions

Section 5.7.1 requires that permit units subject to District Rule 4320, Section 5.2 shall both install and maintain an operational APCO approved Continuous Emission Monitoring System (CEMS) for NO_x, CO and O₂, or implement an APCO-approved alternate monitoring.

BPC proposes to use Alternate Monitoring Scheme A (pursuant to District Policy SSP-1105), which requires that monitoring of NO_x, CO, and O₂ exhaust concentrations shall be conducted at least once per month (in which a source test is not performed) using a portable analyzer. The following conditions will be incorporated into the ATCs to ensure compliance with the requirements of the proposed alternate monitoring plan:

- {4063} The permittee shall monitor and record the stack concentration of NO_x, CO, and O₂ at least once every month (in which a source test is not performed) using a portable analyzer that meets District specifications. Measurement shall be made with the FGR system in the mode of operation (closed or open) in which it was used in the preceding 30 days. Monitoring shall not be required if the unit is not in operation, i.e. the unit need not be started solely to perform monitoring. Monitoring shall be performed within 5 days of restarting the unit unless monitoring has been performed within the last month. [District Rules 4305, 4306, and 4320]
- {4064} If either the NO_x or CO concentrations corrected to 3% O₂, as measured by the portable analyzer, exceed the allowable emissions concentration, the permittee shall return the emissions to within the acceptable range as soon as possible, but no longer than 1 hour of operation after detection. If the portable analyzer readings continue to exceed the allowable emissions concentration after 1 hour of operation after detection, the permittee shall notify the District within the following 1 hour and conduct a certified source test within 60 days of the first exceedance. In lieu of conducting a source test, the permittee may stipulate a violation has occurred, subject to enforcement action. The permittee must then correct the violation, show compliance has been re-established, and resume monitoring procedures. If the deviations are the result of a qualifying breakdown condition pursuant to Rule 1100, the permittee may fully comply with Rule 1100 in lieu of the performing the notification and testing required by this condition. [District Rules 4305, 4306 and 4320]
- {4065} All alternate monitoring parameter emission readings shall be taken with the unit operating either at conditions representative of normal operations or conditions specified in the permit-to-operate. The analyzer shall be calibrated, maintained, and operated in accordance with the manufacturer's specifications and recommendations or a protocol approved by the APCO. Emission readings taken shall be averaged over a 15 consecutive-minute period by either taking a cumulative 15 consecutive-minute sample reading or by taking at least five (5) readings, evenly spaced out over the 15 consecutive-minute period. [District Rules 4305, 4306 and 4320]
- {4066} The permittee shall maintain records of: (1) the date and time of NO_x, CO, and O₂ measurements, (2) the O₂ concentration in percent by volume and the measured NO_x and CO concentrations corrected to 3% O₂, (3) make and model of exhaust gas analyzer, (4) exhaust gas analyzer calibration records, and (5) a description of any corrective action taken to maintain the emissions within the acceptable range. [District Rules 4305, 4306 and 4320]

Section 5.7.6 requires operators complying with Sections 5.4.1.1 or 5.4.1.2 to provide an annual fuel analysis to the District unless a more frequent sampling and reporting period is included in the Permit to Operate. Sulfur analysis shall be performed in accordance with the test methods in Section 6.2.

- Permittee shall determine sulfur content of combusted gas annually or shall demonstrate that the combusted gas is provided from a PUC or FERC regulated source. [District Rules 1081 and 4320]

The following condition will be listed on the ATCs to ensure compliance with the reporting section of this requirement:

- All records shall be maintained and retained on-site for a minimum of five (5) years, and shall be made available for District inspection upon request. [District Rules 1070, 4305, 4306, 4320, and 40 CFR 60.48c(i)]

Section 5.8 Compliance Determination

Section 5.8.1 requires that the operator of any unit shall have the option of complying with either the applicable heat input (lb/MMBtu), emission limits or the concentration (ppmv) emission limits specified in Section 5.2. The emission limits selected to demonstrate compliance shall be specified in the source test proposal pursuant to Rule 1081 (Source Sampling).

Therefore, the following condition will be listed on the ATCs as follows:

- {2976} The source test plan shall identify which basis (ppmv or lb/MMBtu) will be used to demonstrate compliance. [District Rules 4305, 4306, and 4320]

Section 5.8.2 requires that all emissions measurements shall be made with the unit operating either at conditions representative of normal operations or conditions specified in the Permit to Operate. No determination of compliance shall be established within two hours after a continuous period in which fuel flow to the unit is shut off for 30 minutes or longer, or within 30 minutes after a re-ignition as defined in Section 3.0.

Therefore, the following permit condition will be listed on the ATCs as follows:

- {2972} All emissions measurements shall be made with the unit operating either at conditions representative of normal operations or conditions specified in the Permit to Operate. Unless otherwise specified in the Permit to Operate, no determination of compliance shall be established within two hours after a continuous period in which fuel flow to the unit is shut off for 30 minutes or longer, or within 30 minutes after a re-ignition as defined in Section 3.0. For the purposes of permittee-performed alternate monitoring, emissions measurements may be performed at any time after the unit reaches conditions representative of normal operation. [District Rules 4305, 4306, and 4320]

Section 5.8.4 requires that for emissions monitoring pursuant to Sections 5.7.1 and 6.3.1 using a portable NO_x analyzer as part of an APCO approved Alternate Emissions Monitoring System, emission readings shall be averaged over a 15 consecutive-minute period by either taking a cumulative 15-consecutive-minute sample reading or by taking at least five (5) readings evenly spaced out over the 15-consecutive-minute period. Therefore, the following previously listed permit condition will be on the ATCs as follows:

- {4065} All alternate monitoring parameter emission readings shall be taken with the unit operating either at conditions representative of normal operations or conditions specified in the permit-to-operate. The analyzer shall be calibrated, maintained, and operated in accordance with the manufacturer's specifications and recommendations or a protocol approved by the APCO. Emission readings taken shall be averaged over a 15 consecutive-minute period by either taking a cumulative 15 consecutive-minute sample reading or by taking at least five (5) readings, evenly spaced out over the 15 consecutive-minute period. [District Rules 4305, 4306 and 4320]

Section 5.8.5 requires that for emissions source testing performed pursuant to Section 6.3.1 for the purpose of determining compliance with an applicable standard or numerical limitation of this rule, the arithmetic average of three (3) 30-consecutive-minute test runs shall apply. If two (2) of three (3) runs are above an applicable limit the test cannot be used to demonstrate compliance with an applicable limit. Therefore, the following permit condition will be listed on the permit as follows:



- {2980} For emissions source testing, the arithmetic average of three 30-consecutive-minute test runs shall apply. If two of three runs are above an applicable limit the test cannot be used to demonstrate compliance with an applicable limit. [District Rules 4305, 4306 and 4320]

Section 6.1 Recordkeeping

Section 6.1 requires that the records required by Sections 6.1.1 through 6.1.5 shall be maintained for five calendar years and shall be made available to the APCO and EPA upon request. Failure to maintain records or information contained in the records that demonstrate noncompliance with the applicable requirements of this rule shall constitute a violation of this rule.

A permit condition will be listed on the permit as follows:

- All records shall be maintained and retained on-site for a minimum of five (5) years, and shall be made available for District inspection upon request. [District Rules 1070, 4305, 4306, 4320, and 40 CFR 60.48c(i)]

Section 6.2, Test Methods

Section 6.2 identifies the following test methods as District-approved source testing methods for the pollutants listed:

Pollutant	Units	Test Method Required
NO _x	ppmv	EPA Method 7E or ARB Method 100
NO _x	lb/MMBtu	EPA Method 19
CO	ppmv	EPA Method 10 or ARB Method 100
Stack Gas O ₂	%	EPA Method 3 or 3A, or ARB Method 100
Stack Gas Velocities	ft/min	EPA Method 2
Stack Gas Moisture Content	%	EPA Method 4
Oxides of sulfur		EPA Method 6C, EPA Method 8, or ARB Method 100
Total Sulfur as Hydrogen Sulfide (H ₂ S) Content		EPA Method 11 or EPA Method 15, as appropriate.
Sulfur Content of Liquid Fuel		ASTM D 6920-03 or ASTM D 5453-99

The following permit conditions will be listed on the permit as follows:

- {4346} NO_x emissions for source test purposes shall be determined using EPA Method 7E or ARB Method 100 on a ppmv basis, or EPA Method 19 on a heat input basis. [District Rules 4305, 4306, and 4320]

- {4347} CO emissions for source test purposes shall be determined using EPA Method 10 or ARB Method 100. [District Rules 4305, 4306, and 4320]
- {4348} Stack gas oxygen (O₂) shall be determined using EPA Method 3 or 3A or ARB Method 100. [District Rules 4305, 4306, and 4320]
- {4349} Fuel sulfur content shall be determined using EPA Method 11 or Method 15. [District Rule 4320]

Section 6.3, Compliance Testing

Section 6.3.1 requires that this unit be tested to determine compliance with the applicable requirements of section 5.1 and 5.2.3 not less than once every 12 months. Upon demonstrating compliance on two consecutive compliance source tests, the following source test may be deferred for up to thirty-six months.

The following permit conditions will be listed on the ATCs:

- Source testing to measure natural gas-combustion NO_x and CO emissions from this unit shall be conducted within 60 days of initial startup and at least once every twelve (12) months thereafter. After demonstrating compliance on two (2) consecutive annual source tests, the unit shall be tested not less than once every thirty-six (36) months. If the result of the 36-month source test demonstrates that the unit does not meet the applicable emission limits, the source testing frequency shall revert to at least once every twelve (12) months. [District Rules 2201, 4305, 4306, and 4320]
- The results of each source test shall be submitted to the District within 60 days thereafter. [District Rule 1081]

Section 7.0, Compliance Schedule

Section 7.0 identifies the dates by which the operator shall submit an application for an ATC and the date by which the owner shall demonstrate compliance with this rule.

The unit will be in compliance with the emissions limits listed in Table 1, Section 5.2 of this rule, and periodic monitoring and source testing as required by District Rule 4320. Therefore, requirements of the compliance schedule, as listed in Section 7.0 of District Rule 4320, are satisfied. No further discussion is required.

Conclusion

Conditions will be incorporated into the permit in order to ensure compliance with each section of this rule, see attached draft permits in Appendix I. Therefore, compliance with District Rule 4320 requirements is expected.

District Rule 4401 – Steam-Enhanced Crude Oil Production Wells

The purpose of this rule is to limit the VOC emissions from steam-enhanced crude oil production well vents. This rule is applicable to all steam-enhanced crude oil production wells and any associated vapor collection and control systems.

The following condition will ensure compliance with this rules leak definition:

- Gas and liquid leaks are as defined in Section 3.20 of Rule 4401. [District Rule 4401, 3.20]

Section 4.1 exempts any steam-enhanced crude oil production well from this rule when undergoing service or repair during the time the well is not producing. The following condition will ensure compliance with this exemption:

- During the time any steam-enhanced crude oil production well is undergoing service or repair while the well is not producing, it shall be exempt from the emission control requirements of District Rule 4401. [District Rule 4401, 4.1]

Section 4.7 states that the requirements of Section 5.4.1 through Section 5.4.7 of this rule shall not apply to components exclusively handling gas/vapor or liquid with a VOC content of ten percent by weight or less (≤ 10 wt.%), as determined by the test methods in Section 6.3.4:

- The inspection requirements of Section 5.4.1 through Section 5.4.7 of Rule 4401 shall not apply to components exclusively handling gas/vapor or liquid with a VOC content of ten percent by weight (10%) or less, as determined by the test methods in Section 6.3.4 of Rule 4401. [District Rule 4401, 4.7]

Section 5.1 prohibits an operator from operating a steam-enhanced crude oil production well unless either of the following two conditions are met: 1) The steam-enhanced crude oil production well vent is closed and the front line production equipment downstream of the wells that carry produced fluids is connected to a VOC collection and control system as defined in Section 3.0 of this Rule, or 2) the steam-enhanced crude oil production well vent is open and the well vent is connected to a VOC collection and control system that has a VOC collection and control system as defined in Section 3.0 of this Rule.

- An operator shall not operate a steam-enhanced crude oil production well unless the operator complies with either of the following requirements: The steam-enhanced crude oil production well vent is closed and the front line production equipment downstream of the wells that carry produced fluids (crude oil or mixture of crude oil and water) is connected to a VOC collection and control system as defined in Section 3.0 of Rule 4401, the well vent may be temporarily opened during periods of attended service or repair of the well provided such activity is done as expeditiously as possible with minimal spillage of material and VOC emissions to the atmosphere, or the steam-enhanced crude oil production well vent is open and the well vent is connected to a VOC collection and control system as defined in Section 3.0 of Rule 4401. [District Rule 4401, 5.1]

Section 5.2 states that an operator shall be in violation of this rule if any District inspection or operator inspection conducted pursuant to Section 5.4 demonstrates that one or more of the following conditions exist at the facility:

- Existence of an open-ended line or a valve located at the end of the line that is not sealed with a blind flange, plug, cap, or a second closed valve that is not closed at all times, except during attended operations requiring process fluid flow through the open-ended lines. Attended operations include draining or degassing operations, connection of temporary process equipment, sampling of process streams, emergency venting, and other normal operational needs, provided such operations are done as expeditiously as possible and with minimal spillage of material and VOC emissions to the atmosphere; or,
- Existence of a component with a major liquid leak as defined in Section 3.0; or,
- Existence of a component with a gas leak greater than 50,000 ppmv; or,

- Existence of a component leak described in Section 5.2.2.4.1 through Section 5.2.2.4.3 in excess of the allowable number of leaks specified in Table 2.

The following conditions will ensure compliance with this section:

- An operator shall be in violation of this rule if any District inspection demonstrates or if any operator inspection conducted pursuant to Section 5.4 of Rule 4401 demonstrates the existence of an open-ended line or a valve located at the end of the line that is not sealed with a blind flange, plug, cap, or a second closed valve that is not closed at all times, except during attended operations as defined by Section 5.2.2.1 of Rule 4401 requiring process fluid flow through the open-ended lines, a component with a major liquid leak, or a component with a gas leak greater than 50,000 ppmv. [District Rule 4401, 5.2]
- An operator shall be in violation of this rule if any District inspection demonstrates or if any operator inspection conducted pursuant to Section 5.4 of Rule 4401 demonstrates the existence of any combination of components with minor liquid leaks, minor gas leaks, or a gas leaks greater than 10,000 ppmv up to 50,000 ppmv that totals more than number of leaks allowed by Table 2 of Rule 4401. [District Rule 4401, 5.2]

Section 5.3 requires operators to comply with the following requirements:

- An operator shall not use any component with a leak as defined in Section 3.0, or that is found to be in violation of the provisions of Section 5.2.2. However, components that were found leaking may be used provided such leaking components have been identified with a tag for repair, are repaired, or awaiting re-inspection after being repaired within the applicable time frame specified in Section 5.5 of this rule; or,
- Each hatch shall be closed at all times except during sampling or adding of process material through the hatch, or during attended repair, replacement, or maintenance operations, provided such activities are done as expeditiously as possible with minimal spillage of material and VOC emissions to the atmosphere; or,
- An operator shall comply with the requirements of Section 6.7 if there is any change in the description of major components or critical components.

The following conditions will ensure compliance with this section:

- An operator shall not use any component with a leak as defined in Section 3.0 of Rule 4401, or that is found to be in violation of the provisions of Section 5.2.2 of Rule 4401. However, components that were found leaking may be used provided such leaking components have been identified with a tag for repair, are repaired, or awaiting re-inspection after being repaired within the applicable time frame specified in Section 5.5 of Rule 4401. [District Rule 4401, 5.3]
- Each hatch shall be closed at all times except during sampling or adding of process material through the hatch, or during attended repair, replacement, or maintenance operations, provided such activities are done as expeditiously as possible with minimal spillage of material and VOC emissions to the atmosphere. [District Rule 4401, 5.3]
- An operator shall comply with the requirements of Section 6.7 of Rule 4401 if there is any change in the description of major components or critical components. [District Rule 4401, 5.3]

Section 5.4 an operator shall perform all component inspections and gas leak measurements pursuant to the requirements of Section 6.3.3 with the following exceptions and additions:

- Except for pipes and unsafe-to-monitor components, an operator shall inspect all other components pursuant to the requirements of Section 6.3.3 at least once every year; or,

- An operator shall visually inspect all pipes at least once every year. Any visual inspection of pipes that indicates a leak that cannot be immediately repaired to meet the leak standards of this rule shall be inspected within 24 hours after detecting the leak. If a leak is found, the leak shall be repaired as soon as practicable but not later than the time frame specified in Table 3 of this rule; or,
- In addition to the inspections required by Section 5.4.1, an operator shall inspect for leaks all accessible operating pumps, compressors, and PRDs in service as follows:
 - An operator shall audio-visually (by hearing and by sight) inspect for leaks all accessible operating pumps, compressors, and PRDs in service at least once each calendar week; or,
 - Any audio-visual inspection of an accessible operating pump, compressor, and PRD performed by an operator that indicates a leak that cannot be immediately repaired to meet the leak standards of this rule shall be inspected not later than 24 hours after conducting the audio-visual inspection. If a leak is found, the leak shall be repaired as soon as practicable but not later than the time frame specified in Table 3 of this rule.
- In addition to the inspections required by Section 5.4.1, Section 5.4.2 and Section 5.4.3, an operator shall perform the following inspections:
 - An operator shall initially inspect a PRD that releases to the atmosphere as soon as practicable but not later than 24 hours after the discovery of the release. An operator shall re-inspect the PRD not earlier than 24 hours after the initial inspection but not later than 15 calendar days after the initial inspection; or,
 - An operator shall inspect all new, replaced, or repaired fittings, flanges, and threaded connections within 72 hours of placing the component in service; or,
 - Except for PRDs subject to the requirements of Section 5.4.4.1, an operator shall inspect a component that has been repaired or replaced not later than 15 calendar days after the component was repaired or replaced.
- An operator shall inspect all unsafe-to-monitor components during each turnaround; or,
- A District inspection in no way fulfills any of the mandatory inspection requirements that are placed upon operators and cannot be used or counted as an inspection required of an operator.

The following conditions will ensure compliance with this section:

- Except for pipes and unsafe-to-monitor components, an operator shall inspect all other components pursuant to the requirements of Section 6.3.3 of Rule 4401 at least once every year. [District Rule 4401, 5.4.1]
- An operator shall visually inspect all pipes at least once every year. Any visual inspection of pipes that indicates a leak that cannot be immediately repaired to meet the leak standards of this rule shall be inspected within 24 hours after detecting the leak. If a leak is found, the leak shall be repaired as soon as practicable but not later than the time frame specified in Table 3 of Rule 4401. [District Rule 4401, 5.4.2]
- In addition to the inspections required by Section 5.4.1 of Rule 4401, an operator shall inspect for leaks all accessible operating pumps, compressors, and PRDs in service as follows: An operator shall audio-visually (by hearing and by sight) inspect for leaks all accessible operating pumps, compressors, and PRDs in service at least once each calendar week. Any audio-visual inspection of an accessible operating pump, compressor, and PRD performed by an operator that indicates a leak that cannot be immediately repaired to meet the leak standards of this rule shall be inspected not later than 24 hours after conducting the audio-visual inspection. If a leak is found, the leak shall

be repaired as soon as practicable but not later than the time frame specified in Table 3 of Rule 4401. [District Rule 4401, 5.4.3]

- In addition to the inspections required by Sections 5.4.1, 5.4.2 and 5.4.3 of Rule 4401, operator shall perform the following: initially inspect a PRD that releases to the atmosphere as soon as practicable but not later than 24 hours after the discovery of the release, re-inspect the PRD not earlier than 24 hours after the initial inspection but not later than 15 calendar days after the initial inspection, inspect all new, replaced, or repaired fittings, flanges, and threaded connections within 72 hours of placing the component in service. Except for PRDs subject to the requirements of Section 5.4.4.1 of Rule 4401, an operator shall inspect a component that has been repaired or replaced not later than 15 calendar days after the component was repaired or replaced. [District Rule 4401, 5.4.4]
- An operator shall inspect all unsafe-to-monitor components during each turnaround. [District Rule 4401, 5.4.7]
- District inspection in no way fulfills any of the mandatory inspection requirements that are placed upon operators and cannot be used or counted as an inspection required of an operator. [District Rule 4401, 5.4.8]

Section 5.5 outlines leak repair requirements as follows:

- An operator shall affix a readily visible weatherproof tag to a leaking component upon detection of the leak. An operator shall include the following information on the tag:
 - The date and time of leak detection.
 - The date and time of leak measurement.
 - For a gaseous leak, the leak concentration in ppmv.
 - For a liquid leak, whether it is a major liquid leak or a minor liquid leak.
 - Whether the component is an essential component, an unsafe-to monitor component, or a critical component.
- An operator shall keep the tag affixed to the component until an operator has met all of the following conditions:
 - Repaired or replaced the leaking component, and
 - Re-inspected the component using the test method in Section 6.3.3, and
 - The component is found to be in compliance with the requirements of this rule.
- An operator shall minimize a component leak in order to stop or reduce leakage to the atmosphere immediately to the extent possible, but not later than one (1) hour after detection of the leak.
- Except for leaking critical components or leaking essential components subject to the requirements of Section 5.5.7, if an operator has minimized a leak but the leak still exceeds the applicable leak limits as defined in Section 3.0, an operator shall comply with at least one of the following requirements as soon as practicable, but not later than the time period specified in Table 3.
 - Repair or replace the leaking component; or
 - Vent the leaking component to a VOC collection and control system as defined in Section 3.0; or
 - Remove the leaking component from operation
- The leak rate measured after leak minimization has been performed shall be the leak rate used to determine the applicable repair period specified in Table 3.
- Time of the initial leak detection shall be the start of the repair period specified in Table 3.
- If the leaking component is an essential component or a critical component that cannot be immediately shut down for repairs, and if the leak has been minimized but the leak still

exceeds the applicable leak standard of this rule, the operator shall repair or replace the essential component or critical component to eliminate the leak during the next process unit turnaround, but in no case later than one year from the date of the original leak detection, whichever comes earlier.

The following conditions will ensure compliance with this section:

- An operator shall affix a readily visible weatherproof tag to a leaking component upon detection of the leak and shall include the following information on the tag: date and time of leak detection, date and time of leak measurement, for a gaseous leak, the leak concentration in ppmv, for a liquid leak, whether it is a major liquid leak or a minor liquid leak, whether the component is an essential component, an unsafe-to monitor component, or a critical component. [District Rule 4401, 5.5]
- An operator shall keep the tag affixed to the component until an operator has met all of the following conditions: repaired or replaced the leaking component, re-inspected the component using the test method in Section 6.3.3, and the component is found to be in compliance with the requirements of this rule. [District Rule 4401 5.5]
- An operator shall minimize a component leak in order to stop or reduce leakage to the atmosphere immediately to the extent possible, but not later than one (1) hour after detection of the leak. [District Rule 4401, 5.5]
- Except for leaking critical components or leaking essential components subject to the requirements of Section 5.5.7 of Rule 4401, if an operator has minimized a leak but the leak still exceeds the applicable leak limits as defined in Section 3.0 of Rule 4401, an operator shall comply with at least one of the following requirements as soon as practicable but not later than the time period specified in Table 3 of Rule 4401: Repair or replace the leaking component; or vent the leaking component to a VOC collection and control system as defined in Section 3.0 of Rule 4401, or remove the leaking component from operation. [District Rule 4401, 5.5]
- The repair period in calendar days shall not exceed 14 days for minor gas leaks, 5 days for major gas leaks less than or equal to 50,000 ppmv, 2 days for gas leak greater than 50,000 ppmv, 3 days for minor liquid leaks, 2 days for major liquid leaks. [District Rule 4401, 5.5]
- The leak rate measured after leak minimization has been performed shall be the leak rate used to determine the applicable repair period specified in Table 3 of Rule 4401. [District Rule 4401, 5.5]
- The time of the initial leak detection shall be the start of the repair period specified in Table 3 of Rule 4401. [District Rule 4401, 5.5]
- If the leaking component is an essential component or a critical component that cannot be immediately shut down for repairs, and if the leak has been minimized but the leak still exceeds the applicable leak standard of this rule, the operator shall repair or replace the essential component or critical component to eliminate the leak during the next process unit turnaround, but in no case later than one year from the date of the original leak detection, whichever comes earlier. [District Rule 4401, 5.5]

Section 6.1 requires operators to maintain records required by Section 6.1 and Section 6.2 for a period of five (5) years. These records shall be made available to the APCO, California Air Resources Board (ARB), and EPA upon request. The following records shall be maintained:

- The operator of any steam-enhanced crude oil production well shall maintain records of the date and well identification where steam injection or well stimulation occurs.

- A small producer shall maintain monthly records of county-specific crude oil production. For the purpose of this rule, the monthly crude oil production records required by the California Division of Oil, Gas, and Geothermal Resources may be used to satisfy Section 6.1.2.
- An operator of any steam-enhanced crude oil production well shall keep source test records which demonstrate compliance with the control efficiency requirements of the VOC collection and control system as defined in Section 3.0.
- The inspection log maintained pursuant to Section 6.4.
- Records of each calibration of the portable hydrocarbon detection instrument utilized for inspecting components, including a copy of current calibration gas certification from the vendor of said calibration gas cylinder, the date of calibration, concentration of calibration gas, instrument reading of calibration gas before adjustment, instrument reading of calibration gas after adjustment, calibration gas expiration date, and calibration gas cylinder pressure at the time of calibration.
- An operator shall maintain copies at the facility of the training records of the training program operated pursuant to Section 6.5.
- An operator shall keep a copy of the APCO-approved Operator Management Plan at the facility.
- An operator shall keep a list of all gauge tanks, as defined in Section 3.0. The list shall contain the size, identification number, the location of each gauge tank and specify whether the gauge tank is upstream of all front line production equipment.
- The results of gauge tank TVP testing conducted pursuant to Section 6.2.3 shall be submitted to the APCO within 60 days after the completion of the testing.
- An operator that discovers that a PRD has released shall record the date that the release was discovered, and the identity and location of the PRD that released. An operator shall submit such information recorded during the calendar year of the release to the APCO no later than 60 days after the end of the calendar year.

The following conditions will ensure compliance with this section:

- The operator of any steam-enhanced crude oil production well shall maintain records of the date and well identification where steam injection or well stimulation occurs. [District Rule 4401, 6.1]
- An operator of any steam-enhanced crude oil production well shall keep source test records which demonstrate compliance with the control efficiency requirements of the VOC collection and control system as defined in Section 3.0 of Rule 4401. [District Rule 4401, 6.1]
- Operator of any steam-enhanced crude oil production well shall keep an inspection log maintained pursuant to Section 6.4 of Rule 4401. [District Rule 4401, 6.1]
- Records of each calibration of the portable hydrocarbon detection instrument utilized for inspecting components, including a copy of current calibration gas certification from the vendor of said calibration gas cylinder, the date of calibration, concentration of calibration gas, instrument reading of calibration gas before adjustment, instrument reading of calibration gas after adjustment, calibration gas expiration date, and calibration gas cylinder pressure at the time of calibration shall be maintained. [District Rule 4401, 6.1]
- An operator shall maintain copies at the facility of the training records of the training program operated pursuant to Section 6.5 of Rule 4401. [District Rule 4401, 6.1 and 6.5]
- Operator shall keep a copy of the APCO-approved Operator Management Plan at the facility. [District Rule 4401, 6.1 and 6.6]

- Operator shall keep a list of all gauge tanks, as defined in Section 3.0 of Rule 4401. The list shall contain the size, identification number, the location of each gauge tank and specify whether the gauge tank is upstream of all front line production equipment. [District Rule 4401, 6.1]
- The results of gauge tank TVP testing conducted pursuant to Section 6.2.3 shall be submitted to the APCO within 60 days after the completion of the testing. [District Rule 4401, 6.1]
- An operator that discovers that a PRD has released shall record the date that the release was discovered, and the identity and location of the PRD that released. An operator shall submit such information recorded during the calendar year to the APCO no later than 60 days after the end of the calendar year. [District Rule 4401, 6.1]
- All records of required monitoring data and support information shall be maintained for a period of at least five years and shall be made readily available for District inspection upon request. [District Rule 4401, 6.1]

Section 6.2 requires source testing to meet the following requirements:

- An operator shall source test annually all VOC collection and control systems used to control emissions from steam-enhanced crude oil production well vents to determine the control efficiency of the device(s) used for destruction or removal of VOC. Compliance testing shall be performed annually by source testers certified by ARB. Testing shall be performed during June, July, August, or September of each year if the system's control efficiency is dependent upon ambient air temperature. A process system is not subject to compliance source testing requirements.
- If approved by the APCO, a VOC collection and control system is not subject to Section 6.2.1 if all uncondensed VOC emissions collected by the system are controlled by a device meeting one of the following requirements:
 - An internal combustion engine subject to District Rule 4702 (Internal Combustion Engines – Phase 2); or
 - A combustion device subject to District Rule 4320 (Advanced Emission Reduction Options for Boilers, Steam Generators, and Process Heaters Greater than 5.0 MMBtu/hr); District Rule 4307 (Boilers, Steam Generators, and Process Heaters – 2.0 MMBtu/hr to 5.0 MMBtu/hr); or District Rule 4308 (Boilers, Steam Generators, and Process Heaters – 0.075 MMBtu/hr to 2.0 MMBtu/hr); or
 - A unit subject to District Rule 4311 (Flares).
- An operator shall comply with the following requirements for each gauge tank, as defined in Section 3.0:
 - An operator shall conduct periodic TVP testing of each gauge tank at least once every 24 months during summer (July – September), and whenever there is a change in the source or type of produced fluid in the gauge tank.
 - The TVP testing shall be conducted at the actual storage temperature of the produced fluid in the gauge tank using the applicable TVP test method specified in Section 6.4 of Rule 4623 (Storage of Organic Liquids). The operator shall submit the TVP testing results to the APCO as specified in Section 6.1.9.

The following conditions will ensure compliance with this section:

- An operator shall source test annually all vapor collection and control systems used to control emissions from steam-enhanced crude oil production well vents to determine the control efficiency of the device(s) used for destruction or removal of VOC. Compliance testing shall be performed

annually by source testers certified by ARB. Testing shall be performed during June, July, August, or September of each year if the system's control efficiency is dependent upon ambient air temperature. A process system as defined in Section 3.30 of Rule 4401 is not subject to compliance source testing requirements. [District Rule 4401, 6.2]

- If approved by EPA, ARB, and the APCO, an operator need not comply with the annual testing requirement of Section 6.2.1 if all uncondensed VOC emissions collected by a vapor collection are controlled by an internal combustion engine subject to Rule 4702, a combustion device subject to Rule 4320, 4307 or 4308, a flare subject to Rule 4311. [District Rule 4401, 6.2]
- An operator shall comply with the following requirements for each gauge tank, as defined in Section 3.0 of Rule 4401: Conduct periodic TVP testing of each gauge tank at least once every 24 months during summer (July - September), and whenever there is a change in the source or type of produced fluid in the gauge tank. The TVP testing shall be conducted at the actual storage temperature of the produced fluid in the gauge tank using the applicable TVP test method specified in Section 6.4 of Rule 4623 (Storage of Organic Liquids). The operator shall submit the TVP testing results to the APCO as specified in Section 6.1.9 of Rule 4401. [District Rule 4401, 6.2]

Section 6.3 lists test methods that may be used to show compliance. The following conditions will ensure compliance with this section:

- The control efficiency of any VOC control device, measured and calculated as carbon, shall be determined by EPA Method 25, except when the outlet concentration must be below 50 ppm in order to meet the standard, in which case EPA Method 25a may be used. EPA Method 18 may be used in lieu of EPA Method 25 or EPA Method 25a provided the identity and approximate concentrations of the analytes/compounds in the sample gas stream are known before analysis with the gas chromatograph and the gas chromatograph is calibrated for each of those known analyte/compound to ensure that the VOC concentrations are neither under- or over-reported. [District Rule 4401, 6.3]
- VOC content shall be analyzed by using the latest revision of ASTM Method E168, E169, or E260 as applicable. Analysis of halogenated exempt compounds shall be performed by using ARB Method 432. [District Rule 4401, 6.3]
- Leak inspection, other than audio-visual, and measurements of gaseous leak concentrations shall be conducted according to EPA Method 21 using an appropriate portable hydrocarbon detection instrument calibrated with methane. The instrument shall be calibrated in accordance with the procedures specified in EPA Method 21 or the manufacturer's instruction, as appropriate, not more than 30 days prior to its use. The operator shall record the calibration date of the instrument. Where safety is a concern, such as measuring leaks from compressor seals or pump seals when the shaft is rotating, a person shall measure leaks by placing the instrument probe inlet at a distance of one (1) centimeter or less from the surface of the component interface. [District Rule 4401, 6.3]
- The VOC content by weight percent (wt.%) shall be determined using American Society of Testing and Materials (ASTM) D1945 for gases and South Coast Air Quality Management District (SCAQMD) Method 304-91 or the latest revision of ASTM Method E168, E169 or E260 for liquids. [District Rule 4401, 6.3]

Section 6.4 requires operators to maintain an inspection log that records, at a minimum, all of the following information for each inspection performed:

- The total number of components inspected, and the total number and percentage of leaking components found by component type.

- The location, type, and name or description of each leaking component and description of any unit where the leaking component is found.
- The date of leak detection and the method of leak detection.
- For gaseous leaks, the leak concentration in ppmv, and for liquid leaks record whether the leak is a major liquid leak or a minor liquid leak.
- The date of repair, replacement, or removal from operation of leaking components.
- The identify and location of essential components and critical components found leaking that cannot be repaired until the next process unit turnaround or not later than one year after leak detection, whichever comes earlier.
- The methods used to minimize the leak from essential components and critical components found leaking that cannot be repaired until the next process unit turnaround or not later than one year after leak detection, whichever comes earlier.
- The date of re-inspection and the leak concentration in ppmv after the component is repaired or is replaced.
- The inspector's name, business mailing address, and business telephone number.
- The date and signature of the facility operator responsible for the inspection and repair program certifying the accuracy of the information recorded in the log.

The following conditions will ensure compliance with this section:

- Operator shall maintain an inspection log in which an operator records, at a minimum, all of the following information for each inspection performed: The total number of components inspected, total number and percentage of leaking components found by component type, location, type, and name or description of each leaking component and description of any unit where the leaking component is found, date of leak detection and the method of leak detection. For gaseous leaks, the leak concentration in ppmv, and for liquid leaks record whether the leak is a major liquid leak or a minor liquid leak. the date of repair, replacement, or removal from operation of leaking components, identify and location of essential components and critical components found leaking that cannot be repaired until the next process unit turnaround or not later than one year after leak detection, whichever comes earlier, methods used to minimize the leak from essential components and critical components found leaking that cannot be repaired until the next process unit turnaround or not later than one year after leak detection, whichever comes earlier, the date of re-inspection and the leak concentration in ppmv after the component is repaired or is replaced, the inspector's name, business mailing address, and business telephone number, date and signature of the facility operator responsible for the inspection and repair program certifying the accuracy of the information recorded in the log. [District Rule 4401, 6.4]

Section 6.5 requires operators to establish and implement an employee training program for inspecting and repairing components and recordkeeping procedures, as necessary. The following condition will ensure compliance with this section:

- An operator shall maintain copies at the facility of the training records of the training program operated pursuant to Section 6.5 of Rule 4401. [District Rule 4401, 6.1 and 6.5]

Section 6.6 requires an operator to prepare and submit an Operator Management Plan for approval by the APCO. An operator may use diagrams, charts, spreadsheets, or other methods approved by the APCO to describe the information required by Section 6.6.4 through Section 6.6.7. The following condition will ensure compliance with this section:

- Operator shall keep a copy of the APCO-approved Operator Management Plan at the facility. [District Rule 4401, 6.1 and 6.6]

Section 6.7 requires that by January 30 of each year, an operator shall submit to the APCO for approval, in writing, an annual report indicating any changes to an existing Operator Management Plan.

The following conditions will ensure compliance with this section:

- By January 30 of each year, an operator shall submit to the APCO for approval, in writing, an annual report indicating any changes to an existing Operator Management Plan. [District Rule 4401, 6.7]

Rule 4406 Sulfur Compounds From Oil-Field Steam Generators – Kern County

This rule limits sulfur compound emissions to 0.11 lb/MMBtu for existing steam generators located in Kern County. An existing steam generator is defined as one that had an ATC or PTO prior to September 12, 1979. This project involves new steam generators only. Therefore, this rule is not applicable.

Rule 4801 Sulfur Compounds

A person shall not discharge into the atmosphere sulfur compounds, which would exist as a liquid or gas at standard conditions, exceeding in concentration at the point of discharge: 0.2 % by volume calculated as SO₂, on a dry basis averaged over 15 consecutive minutes.

In addition, the unit is also subject to District Rule 4320, *Advanced Emission Reduction Options for Boilers, Steam Generators, and Process heaters Greater than 5.0 MMBTU/hr*. Since emissions limits of District Rule 4320 and all other requirements are equivalent or more stringent than District Rule 4801 requirements, compliance with District Rule 4320 requirements will satisfy requirements of District Rule 4801. Therefore the following condition, previously discussed, will ensure compliance with this rule:

- Except for periods of startup and shutdown, emissions from the natural gas-fired unit shall not exceed any of the following limits: 7 ppmvd NO_x @ 3% O₂ or 0.008 lb-NO_x/MMBtu, 0.005 lb-PM₁₀/MMBtu, 35 ppmvd CO @ 3% O₂ or 0.026 lb-CO/MMBtu, or 0.0055 lb-VOC/MMBtu. [District Rules 2201, 4201, 4301, 4305, 4306, 4320, and 4801]

California Health & Safety Code 42301.6 (School Notice)

The District has verified that this site is not located within 1,000 feet of a school. Therefore, pursuant to California Health and Safety Code 42301.6, a school notice is not required.

California Environmental Quality ACT (CEQA)

The California Environmental Quality Act (CEQA) requires each public agency to adopt objectives, criteria, and specific procedures consistent with CEQA Statutes and the CEQA Guidelines for administering its responsibilities under CEQA, including the orderly evaluation of projects and preparation of environmental documents. The San Joaquin Valley Unified Air Pollution Control District (District) adopted its *Environmental Review Guidelines* (ERG) in 2001. The basic purposes of CEQA are to:

- Inform governmental decision-makers and the public about the potential, significant environmental effects of proposed activities.
- Identify the ways that environmental damage can be avoided or significantly reduced.
- Prevent significant, avoidable damage to the environment by requiring changes in projects through the use of alternatives or mitigation measures when the governmental agency finds the changes to be feasible.
- Disclose to the public the reasons why a governmental agency approved the project in the manner the agency chose if significant environmental effects are involved.

The California Division of Oil, Gas and Geothermal Resources (DOGGR) is the public agency having principal responsibility for approving the project. As such, DOGGR served as the Lead Agency (CCR §15367). In approving the project, the Lead Agency prepared and adopted a Mitigated Negative Declaration. The Lead agency filed a Notice of Determination, stating that the environmental document was adopted pursuant to the provisions of CEQA and concluding that the project would not have a significant effect on the environment.

The District is a Responsible Agency for the project because of its discretionary approval power over the project via its Permits Rule (Rule 2010) and New Source Review Rule (Rule 2201), (CCR §15381). As a Responsible Agency the District complies with CEQA by considering the environmental document prepared by the Lead Agency, and by reaching its own conclusion on whether and how to approve the project (CCR §15096).

The District has considered the Lead Agency's environmental document. Furthermore, the District has conducted an engineering evaluation of the project, this document, which demonstrates that Stationary Source emissions from the project would be below the District's thresholds of significance for criteria pollutants. Thus, the District finds that through a combination of project design elements, compliance with applicable District rules and regulations, and compliance with District air permit conditions, project specific stationary source emissions will have a less than significant impact on air quality. The District does not have authority over any of the other project impacts and has, therefore, determined that no additional findings are required (CEQA Guidelines §15096(h)).

IX. Recommendation

Compliance with all applicable rules and regulations is expected. Issue Authorities to Construct S-1246-296-23, '-364-0, '-365-0, '-366-0, '-367-0, and '-368-0 subject to the permit conditions on the attached draft Authorities to Construct in Appendix I.

X. Billing Information

Annual Permit Fees			
Permit Number	Fee Schedule	Fee Description	Annual Fee
S-1246-296-23	3020-09-A	1,1135 wells	\$1060.90
S-1246-364-0	3020-02-H	85.0 MMBtu/hr	\$1,030.00
S-1246-365-0	3020-02-H	85.0 MMBtu/hr	\$1,030.00
S-1246-366-0	3020-02-H	85.0 MMBtu/hr	\$1,030.00
S-1246-367-0	3020-02-H	85.0 MMBtu/hr	\$1,030.00
S-1246-368-0	3020-02-H	85.0 MMBtu/hr	\$1,030.00

Appendices

- A: Base Documents**
- B: BACT Guidelines**
- C: BACT Analyses**
- D: Health Risk Assessment and Ambient Air Quality Analysis**
- E: Statewide Compliance Statement and Title V Compliance Certification Form**
- F: Quarterly Net Emissions Change**
- G: Tank Emissions Spreadsheet**
- H: Fugitive Emissions Spreadsheets & Federal Major Source PM₁₀ Emission**
- I: Draft Authorities to Construct**

APPENDIX A

Base Documents



AUTHORITY TO CONSTRUCT

PERMIT NO: S-1246-296-28

ISSUANCE DATE: 07/11/2012

LEGAL OWNER OR OPERATOR: BERRY PETROLEUM COMPANY
MAILING ADDRESS: ATTN: EH&S MANAGER
5201 TRUXTUN AVENUE SUITE 100
BAKERSFIELD, CA 93309-0422

LOCATION: HEAVY OIL WESTERN STATIONARY SOURCE
KERN COUNTY, CA

SECTION: 02 **TOWNSHIP:** 31S **RANGE:** 22E

EQUIPMENT DESCRIPTION:

MODIFICATION OF THERMALLY ENHANCED OIL RECOVERY (TEOR) OPERATION WELL VENT VAPOR CONTROL SYSTEM SERVING 1200 WELLS INCLUDING GAS/LIQUID SEPARATORS, HEAT EXCHANGERS, COMPRESSORS, INLET SEPARATOR VESSELS, CONDENSATE PUMPS, SULFUR SCRUBBER, VAPOR PIPING FROM TANKS '337 AND '339 AND VAPOR PIPING TO STEAM GENERATORS S-1246-3, '-24, '-46, '-119, '-292, '-293, '-342, '-343, '-344, '-345, '-346, '-355, '-356, '-357, '-358, AND '-359 AND/OR DOGGR APPROVED GAS DISPOSAL WELLS (NMWSS): INCREASE NUMBER OF WELLS FROM 1200 TO 1350 AND INSTALL ADDITIONAL VAPOR RECOVERY COMPRESSORS

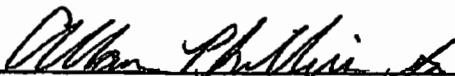
CONDITIONS

1. The facility shall submit an application to modify the Title V permit in accordance with the timeframes and procedures of District Rule 2520. [District Rule 2520] Federally Enforceable Through Title V Permit
2. Permit to Operate S-1246-163 shall be cancelled upon implementation of this Authority to Construct. [District Rule 2201] Federally Enforceable Through Title V Permit
3. TEOR operation is authorized to operate at the following locations: Sections 1, 2, 3, 11, and 12 T31S, R22E. [District Rule 2201] Federally Enforceable Through Title V Permit
4. Well vent vapor from this TEOR operation shall only be incinerated in approved steam generators or disposed of in DOGGR approved gas disposal wells. [District Rule 2201] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (661) 392-6600 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT. This is NOT a PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, this Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

Seyed Sadredin, Executive Director / APCO


DAVID WARNER, Director of Permit Services

S-1246-296-28 Jul 11 2012 11:45AM - RICKARDK Joint Inspection NOT Required

5. Well vent vapor from this TEOR operation shall not be incinerated in approved steam generators unless it is first scrubbed in a fuel gas sulfur scrubber and sulfur compounds are reduced by a minimum of 95%. [District Rule 2201] Federally Enforceable Through Title V Permit
6. Compliance with scrubber sulfur removal efficiency requirement shall be demonstrated by measurement of total sulfur compound concentrations at scrubber inlet and outlet. The measurement shall be conducted on grab samples taken at scrubber inlet and outlet using one of the following test methods: ASTM D3246 or double GC for H₂S and mercaptans, or equivalent test method with prior District approval. Grab samples shall be taken and analyzed upon initial use of the scrubber and, thereafter, every six months. If scrubber is not in use at six-month anniversary date, then efficiency shall be demonstrated within two weeks of returning scrubber to service. For each month in which scrubber is operated and laboratory analysis of grab samples is not required, operator shall monitor and adjust scrubber performance as needed using gas-detection tubes calibrated for existing sulfur species or other equivalent District approved sulfur detection method(s) or device(s). [District Rule 2201] Federally Enforceable Through Title V Permit
7. Well vent vapor collection and control system includes piping from sulfur scrubbers to District approved incinerating devices. Well vent vapor collection and control system includes bypass piping around sulfur scrubbers to DOGGR-approved vapor disposal well(s). [District Rule 2201] Federally Enforceable Through Title V Permit
8. Fugitive VOC emissions rate for the TEOR operation, calculated using CAPCOA California Implementation Guidelines for Estimating Mass Emissions of Fugitive Hydrocarbon Leaks at Petroleum Facilities, Table IV-2c, Oil and Gas Production Screening Value Ranges Emission Factors (Feb 1999) and the total number of components in gas/light liquid service, shall not exceed 584.6 lb-VOC/day. [District Rule 2201]
9. During the time any steam-enhanced crude oil production well is undergoing service or repair while the well is not producing, it shall be exempt from the emission control requirements of District Rule 4401. [District Rule 4401] Federally Enforceable Through Title V Permit
10. The inspection requirements of Section 5.4.1 through Section 5.4.7 of Rule 4401 shall not apply to components exclusively handling gas/vapor or liquid with a VOC content of ten percent by weight (10%) or less, as determined by the test methods in Section 6.3.4 of Rule 4401. [District Rule 4401] Federally Enforceable Through Title V Permit
11. Gas and liquid leaks are as defined in Section 3.20 of Rule 4401. [District Rule 4401] Federally Enforceable Through Title V Permit
12. An operator shall not operate a steam-enhanced crude oil production well unless the operator complies with either of the following requirements: The steam-enhanced crude oil production well vent is closed and the front line production equipment downstream of the wells that carry produced fluids (crude oil or mixture of crude oil and water) is connected to a VOC collection and control system as defined in Section 3.0 of Rule 4401, the well vent may be temporarily opened during periods of attended service or repair of the well provided such activity is done as expeditiously as possible with minimal spillage of material and VOC emissions to the atmosphere, or the steam-enhanced crude oil production well vent is open and the well vent is connected to a VOC collection and control system as defined in Section 3.0 of Rule 4401. [District Rule 4401] Federally Enforceable Through Title V Permit
13. An operator shall be in violation of this rule if any District inspection demonstrates or if any operator inspection conducted pursuant to Section 5.4 of Rule 4401 demonstrates the existence of an open-ended line or a valve located at the end of the line that is not sealed with a blind flange, plug, cap, or a second closed valve that is not closed at all times, except during attended operations as defined by Section 5.2.2.1 of Rule 4401 requiring process fluid flow through the open-ended lines, a component with a major liquid leak, or a component with a gas leak greater than 50,000 ppmv. [District Rule 4401] Federally Enforceable Through Title V Permit
14. An operator shall be in violation of this rule if any District inspection demonstrates or if any operator inspection conducted pursuant to Section 5.4 of Rule 4401 demonstrates the existence of any combination of components with minor liquid leaks, minor gas leaks, or a gas leaks greater than 10,000 ppmv up to 50,000 ppmv that totals more than number of leaks allowed by Table 2 of Rule 4401. [District Rule 4401] Federally Enforceable Through Title V Permit
15. An operator shall not use any component with a leak as defined in Section 3.0 of Rule 4401, or that is found to be in violation of the provisions of Section 5.2.2 of Rule 4401. However, components that were found leaking may be used provided such leaking components have been identified with a tag for repair, are repaired, or awaiting re-inspection after being repaired within the applicable time frame specified in Section 5.5 of Rule 4401. [District Rule 4401] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

16. Each hatch shall be closed at all times except during sampling or adding of process material through the hatch, or during attended repair, replacement, or maintenance operations, provided such activities are done as expeditiously as possible with minimal spillage of material and VOC emissions to the atmosphere. [District Rule 4401] Federally Enforceable Through Title V Permit
17. An operator shall comply with the requirements of Section 6.7 of Rule 4401 if there is any change in the description of major components or critical components. [District Rule 4401] Federally Enforceable Through Title V Permit
18. Except for pipes and unsafe-to-monitor components, an operator shall inspect all other components pursuant to the requirements of Section 6.3.3 of Rule 4401 at least once every year. [District Rule 4401] Federally Enforceable Through Title V Permit
19. An operator shall visually inspect all pipes at least once every year. Any visual inspection of pipes that indicates a leak that cannot be immediately repaired to meet the leak standards of this rule shall be inspected within 24 hours after detecting the leak. If a leak is found, the leak shall be repaired as soon as practicable but not later than the time frame specified in Table 3 of Rule 4401. [District Rule 4401] Federally Enforceable Through Title V Permit
20. In addition to the inspections required by Section 5.4.1 of Rule 4401, an operator shall inspect for leaks all accessible operating pumps, compressors, and PRDs in service as follows: An operator shall audio-visually (by hearing and by sight) inspect for leaks all accessible operating pumps, compressors, and PRDs in service at least once each calendar week. Any audio-visual inspection of an accessible operating pump, compressor, and PRD performed by an operator that indicates a leak that cannot be immediately repaired to meet the leak standards of this rule shall be inspected not later than 24 hours after conducting the audio-visual inspection. If a leak is found, the leak shall be repaired as soon as practicable but not later than the time frame specified in Table 3 of Rule 4401. [District Rule 4401] Federally Enforceable Through Title V Permit
21. In addition to the inspections required by Sections 5.4.1, 5.4.2 and 5.4.3 of Rule 4401, operator shall perform the following: initially inspect a PRD that releases to the atmosphere as soon as practicable but not later than 24 hours after the discovery of the release, re-inspect the PRD not earlier than 24 hours after the initial inspection but not later than 15 calendar days after the initial inspection, inspect all new, replaced, or repaired fittings, flanges, and threaded connections within 72 hours of placing the component in service. Except for PRDs subject to the requirements of Section 5.4.4.1 of Rule 4401, an operator shall inspect a component that has been repaired or replaced not later than 15 calendar days after the component was repaired or replaced. [District Rule 4401] Federally Enforceable Through Title V Permit
22. An operator shall inspect all unsafe-to-monitor components during each turnaround. [District Rule 4401] Federally Enforceable Through Title V Permit
23. District inspection in no way fulfills any of the mandatory inspection requirements that are placed upon operators and cannot be used or counted as an inspection required of an operator. [District Rule 4401] Federally Enforceable Through Title V Permit
24. An operator shall affix a readily visible weatherproof tag to a leaking component upon detection of the leak and shall include the following information on the tag: date and time of leak detection, date and time of leak measurement, for a gaseous leak, the leak concentration in ppmv, for a liquid leak, whether it is a major liquid leak or a minor liquid leak, whether the component is an essential component, an unsafe-to monitor component, or a critical component. [District Rule 4401] Federally Enforceable Through Title V Permit
25. An operator shall keep the tag affixed to the component until an operator has met all of the following conditions: repaired or replaced the leaking component, re-inspected the component using the test method in Section 6.3.3, and the component is found to be in compliance with the requirements of this rule. [District Rule 4401] Federally Enforceable Through Title V Permit
26. An operator shall minimize a component leak in order to stop or reduce leakage to the atmosphere immediately to the extent possible, but not later than one (1) hour after detection of the leak. [District Rule 4401] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

27. Except for leaking critical components or leaking essential components subject to the requirements of Section 5.5.7 of Rule 4401, if an operator has minimized a leak but the leak still exceeds the applicable leak limits as defined in Section 3.0 of Rule 4401, an operator shall comply with at least one of the following requirements as soon as practicable but not later than the time period specified in Table 3 of Rule 4401: Repair or replace the leaking component; or vent the leaking component to a VOC collection and control system as defined in Section 3.0 of Rule 4401, or remove the leaking component from operation. [District Rule 4401] Federally Enforceable Through Title V Permit
28. The repair period in calendar days shall not exceed 14 days for minor gas leaks, 5 days for major gas leaks less than or equal to 50,000 ppmv, 2 days for gas leak greater than 50,000 ppmv, 3 days for minor liquid leaks, 2 days for major liquid leaks. [District Rule 4401] Federally Enforceable Through Title V Permit
29. The leak rate measured after leak minimization has been performed shall be the leak rate used to determine the applicable repair period specified in Table 3 of Rule 4401. [District Rule 4401] Federally Enforceable Through Title V Permit
30. The time of the initial leak detection shall be the start of the repair period specified in Table 3 of Rule 4401. [District Rule 4401] Federally Enforceable Through Title V Permit
31. If the leaking component is an essential component or a critical component that cannot be immediately shut down for repairs, and if the leak has been minimized but the leak still exceeds the applicable leak standard of this rule, the operator shall repair or replace the essential component or critical component to eliminate the leak during the next process unit turnaround, but in no case later than one year from the date of the original leak detection, whichever comes earlier. [District Rule 4401] Federally Enforceable Through Title V Permit
32. The operator of any steam-enhanced crude oil production well shall maintain records of the date and well identification where steam injection or well stimulation occurs. [District Rule 4401] Federally Enforceable Through Title V Permit
33. An operator of any steam-enhanced crude oil production well shall keep source test records which demonstrate compliance with the control efficiency requirements of the VOC collection and control system as defined in Section 3.0 of Rule 4401. [District Rule 4401] Federally Enforceable Through Title V Permit
34. Operator of any steam-enhanced crude oil production well shall keep an inspection log maintained pursuant to Section 6.4 of Rule 4401. [District Rule 4401] Federally Enforceable Through Title V Permit
35. Records of each calibration of the portable hydrocarbon detection instrument utilized for inspecting components, including a copy of current calibration gas certification from the vendor of said calibration gas cylinder, the date of calibration, concentration of calibration gas, instrument reading of calibration gas before adjustment, instrument reading of calibration gas after adjustment, calibration gas expiration date, and calibration gas cylinder pressure at the time of calibration shall be maintained. [District Rule 4401] Federally Enforceable Through Title V Permit
36. An operator shall maintain copies at the facility of the training records of the training program operated pursuant to Section 6.5 of Rule 4401. [District Rule 4401] Federally Enforceable Through Title V Permit
37. The results of gauge tank TVP testing conducted pursuant to Section 6.2.3 shall be submitted to the APCO within 60 days after the completion of the testing. [District Rule 4401] Federally Enforceable Through Title V Permit
38. An operator that discovers that a PRD has released shall record the date that the release was discovered, and the identity and location of the PRD that released. An operator shall submit such information recorded during the calendar year to the APCO no later than 60 days after the end of the calendar year. [District Rule 4401] Federally Enforceable Through Title V Permit
39. An operator shall source test annually all vapor collection and control systems used to control emissions from steam-enhanced crude oil production well vents to determine the control efficiency of the device(s) used for destruction or removal of VOC. Compliance testing shall be performed annually by source testers certified by ARB. Testing shall be performed during June, July, August, or September of each year if the system's control efficiency is dependent upon ambient air temperature. A process system as defined in Section 3.30 of Rule 4401 is not subject to compliance source testing requirements. [District Rule 4401] Federally Enforceable Through Title V Permit
40. If approved by EPA, ARB, and the APCO, an operator need not comply with the annual testing requirement of Section 6.2.1 if all uncondensed VOC emissions collected by a vapor collection are controlled by an internal combustion engine subject to Rule 4702, a combustion device subject to Rule 4320, 4307 or 4308, a flare subject to Rule 4311. [District Rule 4401] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

41. An operator shall comply with the following requirements for each gauge tank, as defined in Section 3.0 of Rule 4401: Conduct periodic TVP testing of each gauge tank at least once every 24 months during summer (July - September), and whenever there is a change in the source or type of produced fluid in the gauge tank. The TVP testing shall be conducted at the actual storage temperature of the produced fluid in the gauge tank using the applicable TVP test method specified in Section 6.4 of Rule 4623 (Storage of Organic Liquids). The operator shall submit the TVP testing results to the APCO as specified in Section 6.1.9 of Rule 4401. [District Rule 4401] Federally Enforceable Through Title V Permit
42. The control efficiency of any VOC control device, measured and calculated as carbon, shall be determined by EPA Method 25, except when the outlet concentration must be below 50 ppm in order to meet the standard, in which case EPA Method 25a may be used. EPA Method 18 may be used in lieu of EPA Method 25 or EPA Method 25a provided the identity and approximate concentrations of the analytes/compounds in the sample gas stream are known before analysis with the gas chromatograph and the gas chromatograph is calibrated for each of those known analyte/compound to ensure that the VOC concentrations are neither under- or over-reported. [District Rule 4401] Federally Enforceable Through Title V Permit
43. VOC content shall be analyzed by using the latest revision of ASTM Method E168, E169, or E260 as applicable. Analysis of halogenated exempt compounds shall be performed by using ARB Method 432. [District Rule 4401] Federally Enforceable Through Title V Permit
44. Leak inspection, other than audio-visual, and measurements of gaseous leak concentrations shall be conducted according to EPA Method 21 using an appropriate portable hydrocarbon detection instrument calibrated with methane. The instrument shall be calibrated in accordance with the procedures specified in EPA Method 21 or the manufacturer's instruction, as appropriate, not more than 30 days prior to its use. The operator shall record the calibration date of the instrument. Where safety is a concern, such as measuring leaks from compressor seals or pump seals when the shaft is rotating, a person shall measure leaks by placing the instrument probe inlet at a distance of one (1) centimeter or less from the surface of the component interface. [District Rule 4401] Federally Enforceable Through Title V Permit
45. The VOC content by weight percent (wt.%) shall be determined using American Society of Testing and Materials (ASTM) D1945 for gases and South Coast Air Quality Management District (SCAQMD) Method 304-91 or the latest revision of ASTM Method E168, E169 or E260 for liquids. [District Rule 4401] Federally Enforceable Through Title V Permit
46. Operator shall maintain an inspection log in which an operator records, at a minimum, all of the following information for each inspection performed: The total number of components inspected, total number and percentage of leaking components found by component type, location, type, and name or description of each leaking component and description of any unit where the leaking component is found, date of leak detection and the method of leak detection. For gaseous leaks, the leak concentration in ppmv, and for liquid leaks record whether the leak is a major liquid leak or a minor liquid leak. the date of repair, replacement, or removal from operation of leaking components, identify and location of essential components and critical components found leaking that cannot be repaired until the next process unit turnaround or not later than one year after leak detection, whichever comes earlier, methods used to minimize the leak from essential components and critical components found leaking that cannot be repaired until the next process unit turnaround or not later than one year after leak detection, whichever comes earlier, the date of re-inspection and the leak concentration in ppmv after the component is repaired or is replaced, the inspector's name, business mailing address, and business telephone number, date and signature of the facility operator responsible for the inspection and repair program certifying the accuracy of the information recorded in the log. [District Rule 4401] Federally Enforceable Through Title V Permit
47. Operator shall establish and implement an employee training program for inspecting and repairing components and recordkeeping procedures, as necessary. [District Rule 4401]
48. In accordance with the approved Operator Management Plan (OMP), permittee shall meet all applicable operating, leak standards, inspection and re-inspection, leak repair, record keeping, and notification requirements of Rule 4401. [District Rule 4401]
49. Operator shall keep a copy of the APCO-approved Operator Management Plan at the facility. [District Rule 4401] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

50. Operator shall keep a list of all gauge tanks, as defined in Section 3.0 of Rule 4401. The list shall contain the size, identification number, the location of each gauge tank and specify whether the gauge tank is upstream of all front line production equipment. [District Rule 4401] Federally Enforceable Through Title V Permit
51. By January 30 of each year, an operator shall submit to the APCO for approval, in writing, an annual report indicating any changes to an existing Operator Management Plan. [District Rule 4401] Federally Enforceable Through Title V Permit
52. All records of required monitoring data and support information shall be maintained for a period of at least five years and shall be made readily available for District inspection upon request. [District Rule 4401] Federally Enforceable Through Title V Permit
53. Source testing shall be conducted using the methods and procedures approved by the District. The District must be notified at least 30 days prior to any compliance source test, and a source test plan must be submitted for approval at least 15 days prior to testing. [District Rule 1081] Federally Enforceable Through Title V Permit
54. Collected vapors shall be disposed of in District approved incineration devices, as listed on this permit, or in Department of Oil, Gas and Geothermal Resources (DOGGR) approved vapor disposal wells. Permittee shall make documentation of DOGGR approval for injection wells readily available for District inspection upon request. [District Rule 2201] Federally Enforceable Through Title V Permit
55. The operator shall maintain records of the fugitive component count and calculated VOC emissions. [District Rule 2201] Federally Enforceable Through Title V Permit
56. Permittee shall maintain a written record of inlet and outlet sulfur compound measurements and recharging dates and such records shall be made readily available for District inspection upon request. [District Rule 2201] Federally Enforceable Through Title V Permit
57. Permittee shall maintain with the permit a current listing of all steam enhanced wells with casing vents connected to the well vent collection and control system. [District Rules 1070 and 2520, 9.3.2] Federally Enforceable Through Title V Permit
58. All records shall be maintained and retained on-site for a minimum of five (5) years, and shall be made available for District inspection upon request. [District Rule 1070]

APPENDIX B

BACT Guidelines

Best Available Control Technology (BACT) Guideline 1.2.1
Last Update: 5/24/2004

Oil field Steam Generator (> or = 5 MMBtu/hr)

Pollutant	Achieved in Practice or in the SIP	Technologically Feasible	Alternate Basic Equipment
CO	50 ppmvd @ 3% O2		
NOx	14 ppmvd @ 3% O2	1) 0 ppmvd @ 3% O2 (low NOx burner and/or SCR) 2) 12 ppmvd @ 3% O2	Rescinded
PM10	natural gas, LPG, waste gas treated to remove 95% by weight of sulfur compounds or treated such that the sulfur content does not exceed 1 gr of sulfur compounds (as S) per 100 scf, or use of a continuously operating SO2 scrubber and either achieving 95% by weight control of sulfur compounds or achieving an emissions rate of 30 ppmvd SO2 at stack O2		
SOx	natural gas, LPG, waste gas treated to remove 95% by weight of sulfur compounds or treated such that the sulfur content does not exceed 1 gr of sulfur compounds (as S) per 100 scf, or use of a continuously operating SO2 scrubber and either achieving 95% by weight control of sulfur compounds or achieving an emissions rate of 30 ppmvd SO2 at stack O2		
VOC	Gaseous fuel		

BACT is the most stringent control technique for the emissions unit and class of source. Control techniques that are not achieved in practice or contained in a state implementation plan must be cost effective as well as feasible. Economic analysis to demonstrate cost effectiveness is required for all determinations that are not achieved in practice or contained in an EPA approved State Implementation Plan.

**Best Available Control Technology (BACT) Guideline 7.1.1
Last Update: 3/11/1994**

Thermally Enhanced Oil Recovery - Steam Drive Oil Wells**

Pollutant	Achieved in Practice or in the SIP	Technologically Feasible	Alternate Basic Equipment
PM10		1. Vapor control system with either a) Scrubber with 50% PM10 removal, or b) Non-condensables incinerated at steam generator, incinerator, or equal and having a vapor sulfur content no greater than 0.2gr S/100 dscf	1. Vapor control system with either a) Transfer of noncondensable vapors to gas pipeline or b) Re-injection to formation
SOx		1. Vapor control system with either a) Scrubber with 95% sulfur removal, or b) Non-condensables incinerated at steam generator, incinerator, or equal and having a vapor sulfur content no greater than 0.2gr S/100 dscf	1. Vapor control system with either a) Transfer of noncondensable vapors to gas pipeline or b) Re-injection to formation
VOC	1. Vapor control system and inspection and maintenance program with either a) Non-condensables balanced casing vent system tied into tank vapor control system or b) Noncondensables incinerated at steam generator, incinerator, or equal		1. Vapor control system with either a) Transfer of noncondensable vapors to gas pipeline or b) Re-injection to formation

**** Control Options wording clarified 10/1/02. No change to any options or limits.**

BACT is the most stringent control technique for the emissions unit and class of source. Control techniques that are not achieved in practice or contained in a state implementation plan must be cost effective as well as feasible. Economic analysis to demonstrate cost effectiveness is required for all determinations that are not achieved in practice or contained in an EPA approved State Implementation Plan.

APPENDIX C

BACT Analyses

Steam Generator BACT Analysis

Top Down BACT Analysis for the Steam Generator

Oxides of nitrogen (NO_x) are generated from the high temperature combustion of the natural gas fuel. A majority of the NO_x emissions are formed from the high temperature reaction of nitrogen and oxygen in the inlet air. The rest of the NO_x emissions are formed from the reaction of fuel-bound nitrogen with oxygen in the inlet air.

1. BACT Analysis for NO_x Emissions:

a. Step 1 - Identify all control technologies

The District adopted District Rule 4320 on October 16, 2008. The NO_x emission limit requirements in District Rule 4320 are lower than the current BACT limits; therefore a project specific BACT analysis will be performed to determine BACT for this project. District Rule 4320 includes a compliance option that limits oilfield steam generators with heat input ratings greater than 20 MMBtu/hr to 7 ppm @ 3% O₂. This emission limit is Achieved in Practice control technology for the BACT analysis. District Rule 4320 also contains an enhanced schedule option that allows applicants additional time to meet the requirements of the rule. The enhanced schedule NO_x emission limit requirement is 5 ppmv @ 3% O₂. Since this is an enhanced option in the rule, it will be considered the Technologically Feasible control technology for the BACT analysis.

The SJVAPCD BACT Clearinghouse guideline 1.2.1 has been rescinded. Therefore a new BACT analysis is required. The following are possible control technologies:

- 1) 5 ppmvd @ 3% O₂ with SCR
- 2) 7 ppmvd @ 3% O₂

b. Step 2 - Eliminate technologically infeasible options

There are no technologically infeasible options to eliminate from step 1.

c. Step 3 - Rank remaining options by control effectiveness

- 1) 5 ppmvd @ 3% O₂ with SCR
- 2) 7 ppmvd @ 3% O₂

d. Step 4 - Cost Effectiveness Analysis

A cost effective analysis is required for technologically feasible control options that are not proposed. The applicant is proposing a NO_x limit of 7 ppmvd @ 3% O₂; therefore, a cost effective analysis is required for the 5 ppmvd @ 3% O₂ option (SCR).

SCR Cost Effectiveness Analysis

Assumptions:

Industry standard (IS) assumed to be a NO_x emission rate of 15 ppmv @ 3% O₂ in accordance with District Rule 4306.

A unit's maximum emissions are defined by the burner size multiplied by the emissions factor and a maximum annual operating schedule of 8,760 hr/year.

Calculations:

Industry Standard NO_x Emissions = 85 MMBtu/hr x 0.018 lb/MMBtu x 8,760 hrs/year
= 13,403 lb/year

Tech. Feasible NO_x Emissions = 85 MMBtu/hr x 0.006 lb/MMBtu x 8,760 hrs/year
= 4,468 lb/year

Selective Catalytic Reduction system (Detailed costs follow the BACT Analysis Section):

Capital Cost (provided by PCL Industrial Services, Inc. with this project): **\$745,000** (includes all purchased equipment, taxes, freight, and installation of SCR for an 85.0 MMBtu/hr unit).

Equivalent Annual Capital Cost (Capital Recovery):

$$A = P \frac{i(1+i)^n}{(1+i)^n - 1} \quad \text{where;}$$

A = Equivalent Annual Control Equipment Capital Cost

P = Present value of the control equipment, including installation cost

i = interest rate (use 10%, or demonstrate why alternate is more representative of the specific operation).

n = equipment life (assume 10 years or demonstrate why alternate is more representative of the specific operation)

Where:

P = \$745,000

i = 10%,

n = 10 years

A = \$121,212

Operating costs are estimated by PCL Industrial Services to be \$125,000/yr resulting in the following total annualized cost:

$$\$121,212 + \$125,000 = \$246,212$$

NOx Reduction due to Selective Catalytic Reduction system:

Total reduction = Emissions_{15 ppm} – Emissions_{5 ppm}

Total reduction = 13,403 lb/year – 4,468 lb/year

Total reduction = 8,935 lb/year = 4.47 ton NO_x per year

Cost effectiveness:

Cost effectiveness = \$246,212/ 4.47 tpy

Cost effectiveness = \$55,081/ ton

The cost effectiveness is greater than the \$24,500/ton cost effectiveness threshold of the District BACT policy. Therefore the use of SCR with ammonia injection is not cost effective and is not required as BACT.

e. Step 5 - Select BACT

BACT for NO_x emissions from this oil field steam generator is a NO_x limit of 7 ppmvd @ 3% O₂. The applicant has proposed to install an oil field steam generator with a NO_x limit of 7 ppmvd @ 3% O₂; therefore BACT for NO_x emissions is satisfied.

2. BACT Analysis for SO_x Emissions:

Oxides of sulfur (SO_x) emissions occur from the combustion of the sulfur, which is present in the fuel.

a. Step 1 - Identify all control technologies

The SJVAPCD BACT Clearinghouse guideline 1.2.1, 1st quarter 2005, identifies for achieved in practice BACT for SO_x emissions from oil field steam generators ≥5 MMBtu/hr as follows:

- 1) Natural gas, LPG, waste gas treated to remove 95% by weight of sulfur compounds or treated such that the sulfur content does not exceed 1 gr of sulfur compounds (as S) per 100 scf, or use of a continuously operating SO₂ scrubber and either achieving 95% by weight control of sulfur compounds or achieving an emission rate of 30 ppmvd SO₂ at stack O₂

No technologically feasible alternatives or control alternatives identified as alternate basic equipment for this class and category of source are listed.

b. Step 2 - Eliminate technologically infeasible options

There are no technologically infeasible options to eliminate from step 1.

c. Step 3 - Rank remaining options by control effectiveness

- 1) Natural gas, LPG, waste gas treated to remove 95% by weight of sulfur compounds or treated such that the sulfur content does not exceed 1 gr of sulfur compounds (as S) per 100 scf, or use of a continuously operating SO₂ scrubber and either achieving 95% by weight control of sulfur compounds or achieving an emission rate of 30 ppmvd SO₂ at stack O₂

d. Step 4 - Cost Effectiveness Analysis

The only control technology in the ranking list from Step 3 has been achieved in practice. Therefore, per the District's BACT Policy (dated 11/9/99) Section IX.D.2, the cost effectiveness analysis is not required.

e. Step 5 - Select BACT

The applicant has proposed to combust natural gas with a fuel sulfur content not exceed 1 gr-S/100 dscf; therefore BACT for SO_x emissions is satisfied.

3. BACT Analysis for PM₁₀ Emissions:

Particulate matter (PM₁₀) emissions result from the incomplete combustion of various elements in the fuel.

a. Step 1 - Identify all control technologies

The SJVAPCD BACT Clearinghouse guideline 1.2.1, 1st quarter 2005, identifies for achieved in practice BACT for PM₁₀ emissions from oil field steam generators ≥ 5 MMBtu/hr as follows:

- 1) Natural gas, LPG, waste gas treated to remove 95% by weight of sulfur compounds or treated such that the sulfur content does not exceed 1 gr of sulfur compounds (as S) per 100 scf, or use of a continuously operating SO₂ scrubber and either achieving 95% by weight control of sulfur compounds or achieving an emission rate of 30 ppmvd SO₂ at stack O₂

No technologically feasible alternatives or control alternatives identified as alternate basic equipment for this class and category of source are listed.

b. Step 2 - Eliminate technologically infeasible options

There are no technologically infeasible options to eliminate from step 1.

c. Step 3 - Rank remaining options by control effectiveness

- 1) Natural gas, LPG, waste gas treated to remove 95% by weight of sulfur compounds or treated such that the sulfur content does not exceed 1 gr of sulfur compounds (as S) per 100 scf, or use of a continuously operating SO₂ scrubber and either achieving 95% by weight control of sulfur compounds or achieving an emission rate of 30 ppmvd SO₂ at stack O₂

d. Step 4 - Cost Effectiveness Analysis

The only control technology in the ranking list from Step 3 has been achieved in practice. Therefore, per the District's BACT Policy (dated 11/9/99) Section IX.D.2, the cost effectiveness analysis is not required.

e. Step 5 - Select BACT

The applicant has proposed to combust natural gas with a fuel sulfur content not to exceed 1 gr-S/100 dscf, therefore BACT for PM₁₀ emissions is satisfied.

5. BACT Analysis for CO Emissions:

Carbon monoxide (CO) emissions are generated from the incomplete combustion of air and fuel.

a. Step 1 - Identify all control technologies

The SJVAPCD BACT Clearinghouse guideline 1.2.1, 1st quarter 2005, identifies for achieved in practice BACT for CO emissions from oil field steam generators ≥ 5 MMBtu/hr as follows:

- 1) 50 ppmvd @ 3% O₂

No technologically feasible alternatives or control alternatives identified as alternate basic equipment for this class and category of source are listed.

b. Step 2 - Eliminate technologically infeasible options

There are no technologically infeasible options to eliminate from step 1.

c. Step 3 - Rank remaining options by control effectiveness

- 1) 50 ppmvd @ 3% O₂

d. Step 4 - Cost Effectiveness Analysis

The only control technology in the ranking list from Step 3 has been achieved in practice. Therefore, per the District's BACT Policy (dated 11/9/99) Section IX.D.2, the cost effectiveness analysis is not required.

e. Step 5 - Select BACT

BACT for CO emissions from an oil field steam generator is a CO limit of 50 ppmvd @ 3% O₂. The applicant has proposed to install oil field steam generators with a CO limit of 35 ppmvd @ 3% O₂; therefore BACT for CO emissions is satisfied.

6. BACT Analysis for VOC Emissions:

Volatile organic compounds (VOC) emissions are generated from the incomplete combustion of the fuel.

a. Step 1 - Identify all control technologies

The SJVAPCD BACT Clearinghouse guideline 1.2.1, 1st quarter 2005, identifies for achieved in practice BACT for VOC emissions from oil field steam generators ≥ 5 MMBtu/hr as follows:

- 1) Gaseous fuel

No technologically feasible alternatives or control alternatives identified as alternate basic equipment for this class and category of source are listed.

b. Step 2 - Eliminate technologically infeasible options

There are no technologically infeasible options to eliminate from step 1.

c. Step 3 - Rank remaining options by control effectiveness

- 1) Gaseous fuel

d. Step 4 - Cost effectiveness analysis

The only control technology in the ranking list from Step 3 has been achieved in practice. Therefore, per the District's BACT Policy (dated 11/9/99) Section IX.D.2, the cost effectiveness analysis is not required.

e. Step 5 - Select BACT

BACT for VOC emissions from an oil field steam generator is gaseous fuel. The applicant has proposed to install oil field steam generators fired on gaseous fuel; therefore BACT for VOC emissions is satisfied.

BACT Analysis for GHG Emissions

GHG emissions are emitted due to the combustion of fuel and may be emitted indirectly, as a result of electrical power usage.

The USEPA's PSD program issues permits to sources for attainment pollutants and includes GHG as a regulated pollutant. Since the USEPA has not established a national ambient air quality standard for GHG, it is not considered a nonattainment pollutant and is, therefore, considered an attainment pollutant and regulated under the PSD program. Since GHG is regulated under the PSD program the BACT process will follow the steps outlined in the Clean Air Act (CAA) discussed in this section.

The CAA § 169(3) defines BACT as:

...an emissions limitation (including a visible emission standard) based on the maximum degree of reduction for each pollutant subject to regulation under the Clean Air Act which would be emitted from any proposed major stationary source or major modification which the Administrator, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such facility through application of production processes and available methods, systems, and techniques, including fuel cleaning, clean fuels, or treatment or innovative fuel combustion techniques for control of each such pollutant...

Pursuant to USEPA's "PSD and Title V Permitting Guidance for Greenhouse Gases" the "Top-Down BACT Process" consists of these five basic steps:

1. Identify all available control technologies;
2. Eliminate all technically infeasible options;
3. Rank remaining control technologies by control effectiveness;
4. Evaluate most effective controls and document results;
 - a. The energy, environmental, and economic impacts are evaluated starting with the top ranked option.
5. Select BACT based on economic, environmental, and/or energy impacts.
 - a. The highest ranked option not eliminated from step 4 is selected as BACT.

Since greenhouse gas is comprised of multiple gases, the objective of this analysis will be to identify control technologies with the lowest emission of a CO₂ equivalent (CO₂e) using the Global Warming Potentials (GWP) identified for the Intergovernmental Panel on Climate Change (IPCC) in the 1996 Second Assessment Report¹.

Though it is recognized that reductions in GHG from fossil fuel fired equipment will result in reductions of other criteria pollutants, as the products of combustion, evaluation of GHG control measures will not include the affect on other criteria pollutants except in cases where an increase in criteria pollutants may be expected as a consequence of the proposed measure (e.g. elimination of FGR which would reduce the fuel demand for a steam generator but with the consequence of increasing NO_x emissions, that is a precursor to ozone, which the SJVAPCD is in extreme non-attainment for).

Step 1 - Identify All Possible Control Technologies

When fired on >50% PUC-quality natural gas, commercial propane, and/or LPG:

- A convection section with at least 235 square feet of heat transfer surface area per MMBtu/hr of maximum rated heat input (verified by the manufacturer) or a manufacturer's overall thermal efficiency rating of 88% – Achieved in Practice
- Variable frequency drive high efficiency electrical motors driving the blower and water pump – Achieved in Practice
- Additional economizer – Technologically Feasible
- Reduced FGR rate and SCR – Technologically Feasible

¹ The Kyoto Protocol fixed the use of GWP values published by the IPCC in 1996 in its SAR, which remains the internationally recognized values today and are used to calculate GHG reductions in the SJVAPCD Best Performance Standards for oilfield steam generators.

When fired on <50% PUC-quality natural gas, commercial propane, and/or LPG:

- Split flow dual pass water feed configuration, a convection section having at least 128 square feet of heat transfer surface area per MMBtu/hr of maximum rated heat input (verified by the manufacturer) and at least six inches of castable refractory or a manufacturer's overall thermal efficiency rating of at least 85% – Achieved in Practice
- Variable frequency drive high efficiency electrical motors driving the blower and water pump – Achieved in Practice
- Additional economizer – Technologically Feasible
- Reduced FGR rate and SCR – Technologically Feasible

Step 2 - Eliminate Technologically Infeasible Options

- Additional economizer – Technologically Feasible

Additional waste-heat can be transferred from the exhaust gasses to the steam by installing an extra economizer, further increasing the thermal efficiency of the steam generator.

Economizers are useful in steam generators that produce a higher quality and lower volume steam. With purified, de-ionized highly filtered water, high quality steam is possible. In oilfield operations neither clean nor de-ionized water is available nor is high quality steam used or useful.

An additional economizer will lower the exhaust gas temperature by transferring the heat energy from exhaust gas to produced steam to increase the quality. However, exhaust gas temperatures must be maintained sufficiently high enough to minimize condensation that can result in exhaust stack corrosion; therefore, adding an economizer to a steam generator is technologically infeasible for oilfield applications.

- Reduced FGR rate and SCR – Technologically Feasible

Flue gas recirculation mixes a portion of the exhaust gas with the oxygen-rich incoming air in the burner's combustion zone. The added exhaust gas absorbs heat from the combustion process, lowering the peak combustion temperature below the threshold where excessive NO_x is formed. Proven FGR technology has been used in steam generators for years to meet the District's standards for low NO_x emissions. While FGR clearly lowers NO_x levels, additional fuel is required to produce the same amount of steam, which reduces the overall thermal efficiency of the unit and creates more GHG emissions per unit of steam output. Therefore, limiting the FGR rate might be a means of reducing GHG emissions.

While reducing the FGR rate on a steam generator will decrease GHG emissions, it will also increase NO_x emissions. Since maintaining reductions in criteria pollutants, and specifically NO_x for which the SJVAPCD is in extreme non-attainment, the reduction of GHG will not be considered for an increase in NO_x emissions. Any increase in NO_x emissions must be mitigated.

The only alternative method for reducing NOx emissions might be SCR, which could make a reduction in the FGR rate feasible. SCR reduces NOx emissions without the need for such extensive FGR. However the SCR system itself results in higher exhaust stack resistance and electric power to operate ammonia or urea injection pumps that offset the energy efficiency gains attributed to the reduced FGR requirement. Therefore, this equipment is not technologically feasible.

Step 3 - Rank Remaining Control Technologies by Control Effectiveness

Since an oilfield steam generator can operate simultaneously with a minimum convection section heat transfer area requirement (or thermal efficiency rating) and variable frequency drive, high efficiency, electric motors driving the blower and water pump, these options will be combined and listed as follows:

When fired on >50% PUC-quality natural gas, commercial propane, and/or LPG:

- Variable frequency drive high efficiency electrical motors driving the blower and water pump; and, a convection section with at least 235 square feet of heat transfer surface area per MMBtu/hr of maximum rated heat input (verified by manufacturer) or a manufacturer's overall thermal efficiency rating of 88%

When fired on <50% PUC-quality natural gas, commercial propane, and/or LPG:

- Variable frequency drive high efficiency electrical motors driving the blower and water pump; and, split flow dual pass water feed configuration, a convection section having at least 128 square feet of heat transfer surface area per MMBtu/hr of maximum rated heat input (verified by the manufacturer) and at least six inches of castable refractory or a manufacturer's overall thermal efficiency rating of at least 85%

Since there is only one option remaining for each type of fuel burned, ranking the control technologies isn't necessary.

Step 4 – Evaluate Controls

The only control technology in the ranking list from Step 3 has been achieved in practice. Therefore, an evaluation of controls is not required.

Step 5 - Select BACT

The following is a summary of the District's BACT determination for CO₂e control:

Pollutant	BACT
CO ₂ e	<p>Variable frequency drive high efficiency electrical motors driving the blower and water pump; and,</p> <p style="text-align: center;"><u>When Firing On:</u></p> <ul style="list-style-type: none"> • PUC quality natural gas, commercial propane, and/or LPG: a convection section with at least 235 square feet of heat transfer surface area per MMBtu/hr of maximum rated heat input (verified by manufacturer) or a manufacturer's overall thermal efficiency rating of 88%;

TEOR Well BACT Analysis

BACT Analysis for TEOR Operation (S-1246-296)

Top Down BACT Analysis for VOC emissions:

Step 1 - Identify All Possible Control Technologies

The SJVAPCD BACT Clearinghouse Guideline 7.1.1 (1st quarter, 2011) identifies the following technologies:

1. Vapor control system and inspection and maintenance program with either:
 - a) Non-condensable balanced casing vent system tied into tank vapor control system or
 - b) Non-condensable incinerated at steam generator, incinerator, or equal (Achieved-In-Practice).

2. Vapor control system with either:
 - a) Transfer of non-condensable vapors to gas pipeline, or
 - b) Re-injection to formation (Alternate Basic Equipment)

Step 2 - Eliminate Technologically Infeasible Options

None of the above listed technologies are technologically infeasible.

Step 3 - Rank Remaining Control Technologies by Control Effectiveness

1. Vapor control system with either:
 - a) Transfer of non-condensable vapors to gas pipeline, or
 - b) Re-injection to formation (Alternate Basic Equipment)

2. Vapor control system and inspection and maintenance program with either:
 - a) Non-condensable balanced casing vent system tied into tank vapor control system or
 - b) Non-condensable incinerated at steam generator, incinerator, or equal (Achieved-In-Practice).

Step 4 - Cost Effectiveness Analysis

A cost effectiveness analysis is not required as the applicant proposes to use a combination of both technologies listed.

Step 5 - Select BACT

The applicant is proposing to tie the steam-enhanced crude oil well production vapors to a tank vapor control system and non-condensable routed to a steam generator for incineration (Achieved-in-Practice) or re-inject the vapors into the formation via disposal wells. Therefore, BACT is satisfied.

BACT Analysis for CO₂e Emissions

GHG emissions, primarily methane (CH₄) are emitted due to the increased number of components required for the connection of expansion number of wells and the vapor control system connecting the wells to approved control devices.

The USEPA's PSD program issues permits to sources for attainment pollutants and includes GHG as a regulated pollutant. Since the USEPA has not established a national ambient air quality standard for GHG, it is not considered a nonattainment pollutant and is, therefore, considered an attainment pollutant and regulated under the PSD program. Since GHG is regulated under the PSD program the BACT process will follow the steps outlined in the Clean Air Act (CAA) discussed in this section.

The CAA § 169(3) defines BACT as:

...an emissions limitation (including a visible emission standard) based on the maximum degree of reduction for each pollutant subject to regulation under the Clean Air Act which would be emitted from any proposed major stationary source or major modification which the Administrator, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such facility through application of production processes and available methods, systems, and techniques, including fuel cleaning, clean fuels, or treatment or innovative fuel combustion techniques for control of each such pollutant...

Pursuant to USEPA's "PSD and Title V Permitting Guidance for Greenhouse Gases" the "Top-Down BACT Process" consists of these five basic steps:

6. Identify all available control technologies;
7. Eliminate all technically infeasible options;
8. Rank remaining control technologies by control effectiveness;
9. Evaluate most effective controls and document results;
 - a. The energy, environmental, and economic impacts are evaluated starting with the top ranked option.
10. Select BACT based on economic, environmental, and/or energy impacts.
 - a. The highest ranked option not eliminated from step 4 is selected as BACT.

Since greenhouse gas is comprised of multiple gases, the objective of this analysis will be to identify control technologies with the lowest emission of a CO₂ equivalent (CO₂e) using the Global Warming Potentials (GWP) identified for the Intergovernmental Panel on Climate Change (IPCC) in the 1996 Second Assessment Report². With a GWP factor of 21, the CH₄ content in fugitive emissions from this collection system will have a much larger impact than the trace CO₂ content.

Step 1 - Identify All Possible Control Technologies

² The Kyoto Protocol fixed the use of GWP values published by the IPCC in 1996 in its SAR, which remains the internationally recognized values today and are used to calculate GHG reductions in the SJVAPCD Best Performance Standards for oilfield steam generators.

The control of VOC emissions, which will indiscriminately control all constituent gasses comprising the fugitive emissions, is assumed to capture and control an identical percentage of GHG emissions using the following methods:

- Minimize fugitive GHG emissions by applying leak standards and I&M requirements to components subject to Rule 4401 requirements

Step 2 - Eliminate Technologically Infeasible Options

There are no Technologically Infeasible Options

Step 3 - Rank Remaining Control Technologies by Control Effectiveness

- Minimize fugitive GHG emissions by applying leak standards and I&M requirements to components subject to Rule 4401 requirements

Step 4 – Evaluate Controls

The most effective control technology in the ranking list from Step 3 is achieved in practice.

Step 5 - Select BACT

BACT for GHG emissions from the TEOR wells is as follows

- Minimize fugitive GHG emissions by applying leak standards and I&M requirements to components subject to Rule 4401 requirements

The TEOR well associated with permit S-1326-296-20, are subject to the leak standards and I&M requirements to components subject to Rule 4401 requirements; therefore, BACT for GHG emissions is satisfied.

APPENDIX D

Health Risk Assessment and Ambient Air Quality Analysis Summary

San Joaquin Valley Air Pollution Control District Risk Management Review

To: Steve Davidson – Permit Services
 From: Leland Villalvazo – Technical Services
 Date: January 7, 2013
 Facility Name: Berry Petroleum Co.
 Location: Sec2, Twn 31S, Rng 22E
 Application #(s): S-1246-296-23, 364-0, 365-0, 366-0, 367-0, & 368-0
 Project #: S-1111978

A. RMR SUMMARY

RMR Summary				
Categories	Wells (Unit 296-23)	Steam Gen. (Unit 364-0)	Steam Gen. (Unit 365-0)	Steam Gen. (Unit 366-0)
Prioritization Score	0.9	0.004	0.004	0.004
Acute Hazard Index	0.17	0.0	0.0	0.0
Chronic Hazard Index	0.00	0.0	0.00	0.00
Maximum Individual Cancer Risk (10 ⁻⁶)	0.12	0.0	0.0	0.0
T-BACT Required?	No	No	No	No
Special Permit Conditions?	No	No	No	No
Categories	Steam Gen. (Unit 367-0)	Steam Gen. (Unit 368-0)	Project Totals	Facility Totals
Prioritization Score	0.004	0.004	0.11	>1
Acute Hazard Index	0.0	0.0	0.17	0.56
Chronic Hazard Index	0.00	0.00	0.0	0.05
Maximum Individual Cancer Risk (10 ⁻⁶)	0.0	0.0	0.12	7.66
T-BACT Required?	No	No		
Special Permit Conditions?	No	No		

Proposed Permit Conditions

To ensure that human health risks will not exceed District allowable levels; the following permit conditions must be included for:

Unit # 296-23, 364-0, 365-0, 366-0, 367-0, & 368-0

No special conditions are required.

B. RMR REPORT

I. Project Description

Technical Services received a request on November 14, 2012 to perform an Ambient Air Quality Analysis and a Risk Management Review for the installation of five new steam generators and associated TEOR wells.

II. Analysis

Technical Services performed a prioritization using the District's HEARTs database. Since the total facility prioritization score was greater than one, a refined health risk assessment was required. Emissions calculated using District approved fugitive Oil Field & Steam Gen emission factors were input into the HEARTs database. The AERMOD model was used, with the parameters outlined below and meteorological data for 2004-2008 from Fellows to determine the dispersion factors (i.e., the predicted concentration or X divided by the normalized source strength or Q) for a receptor grid. These dispersion factors were input into the Hot Spots Analysis and Reporting Program (HARP) risk assessment module to calculate the chronic and acute hazard indices and the carcinogenic risk for the project.

The following parameters were used for the review:

Analysis Parameters Units 364-0, 365-0, 366-0, 367-0, & 368-0			
Source Type	Point	Location Type	Rural
Stack Height (m)	6.096	Closest Receptor (m)	Various
Stack Diameter. (m)	1.07	Type of Receptor	Residential
Stack Exit Velocity (m/s)	9.504	Max Hours per Year	8760
Stack Exit Temp. (°K)	366.48	Fuel Type	NG
Burner Rating (MMBtu/hr)	85		

Technical Services also performed modeling for criteria pollutants CO, NO_x, SO_x and PM₁₀; as well as a RMR. The emission rates used for criteria pollutant modeling were 2.21 lb/hr CO, 0.72 lb/hr NO_x, 0.43 lb/hr SO_x, and 0.43 lb/hr PM₁₀, for each steam generator.

The results from the Criteria Pollutant Modeling are as follows:

Criteria Pollutant Modeling Results*

Diesel ICE	1 Hour	3 Hours	8 Hours.	24 Hours	Annual
CO	Pass	X	Pass	X	X
NO _x	Pass	X	X	X	Pass
SO _x	Pass	Pass	X	Pass	Pass
PM ₁₀	X	X	X	Pass	Pass
PM _{2.5}	X	X	X	Pass	Pass

*Results were taken from the attached PSD spreadsheet.

¹The project was compared to the 1-hour NO₂ National Ambient Air Quality Standard that became effective on April 12, 2010 using the District's approved procedures

²The criteria pollutants are below EPA's level of significance as found in 40 CFR Part 51.165 (b)(2).

III. Conclusion

The acute and chronic indices are below 1.0 and the cancer risk factor associated with the project is less than 1.0 in a million. **In accordance with the District's Risk Management Policy, the project is approved without Toxic Best Available Control Technology (T-BACT).**

To ensure that human health risks will not exceed District allowable levels; the permit conditions listed on page 1 of this report must be included for this proposed unit.

These conclusions are based on the data provided by the applicant and the project engineer. Therefore, this analysis is valid only as long as the proposed data and parameters do not change.

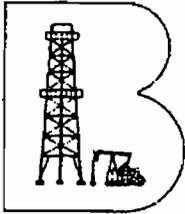
The emissions from the proposed equipment will not cause or contribute significantly to a violation of the State and National AAQS.

IV. Attachments

- A. RMR request from the project engineer
- B. Additional information from the applicant/project engineer
- C. Toxic emissions summary
- D. Prioritization score
- E. Facility Summary

APPENDIX E

Statewide Compliance Statement and Title V Compliance Certification Form



Berry Petroleum Company

5201 Truxtun Ave.
Bakersfield, CA 93309-0421

(661) 616-3900
www.bry.com

December 15, 2011

Mr. Leonard Scandura
San Joaquin Valley Unified APCD
34946 Flyover Court
Bakersfield, CA 93308

RECEIVED
DEC 19 2011
SJVAPCD
Southern Region

RECEIVED
MAY 29 2013
SJVAPCD
Southern Region

**RE: ATC Applications S-1246, 1111128, 1111824, 1111901, 1111902, and
1111978 Compliance Certification per District Rule 2201 Section 4.15.2**

Dear Mr. Scandura:

Pursuant to the requirement of San Joaquin Valley APCD Rule 2201 section 4.15.2, Berry Petroleum Company (BPC) submits this Compliance Certification regarding other owned, operated, or controlled major stationary sources in California. As of the date of this letter, BPC asserts that all major stationary sources owned or operated by BPC (or by any entity controlling, controlled by, or under common control with BPC) in California, which are subject to emission limitations, are in compliance or on a schedule for compliance with all applicable emission limitations and standards.

If you have any questions or require additional information please contact Mr. John Ludwick at phone number (661) 616-3807 or by cell phone number (661) 703-2920.

Sincerely,

Tim Crawford
Senior V.P. of California

San Joaquin Valley
Unified Air Pollution Control District

RECEIVED
MAY 19 2011
SJVAPCD
Southern Region

TITLE V MODIFICATION - COMPLIANCE CERTIFICATION FORM

I. TYPE OF PERMIT ACTION (Check appropriate box)

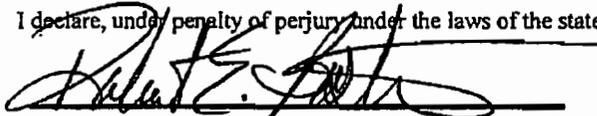
- SIGNIFICANT PERMIT MODIFICATION ADMINISTRATIVE AMENDMENT
 MINOR PERMIT MODIFICATION

COMPANY NAME: Berry Petroleum Company	FACILITY ID: S - 1246
1. Type of Organization: <input checked="" type="checkbox"/> Corporation <input type="checkbox"/> Sole Ownership <input type="checkbox"/> Government <input type="checkbox"/> Partnership <input type="checkbox"/> Utility	
2. Owner's Name:	
3. Agent to the Owner: Berry Petroleum Company	

II. COMPLIANCE CERTIFICATION (Read each statement carefully and initial all circles for confirmation):

- Based on information and belief formed after reasonable inquiry, the source identified in this application will continue to comply with the applicable federal requirement(s).
- Based on information and belief formed after reasonable inquiry, the source identified in this application will comply with applicable federal requirement(s) that will become effective during the permit term, on a timely basis.
- Corrected information will be provided to the District when I become aware that incorrect or incomplete information has been submitted.
- Based on information and belief formed after reasonable inquiry, information and statements in the submitted application package, including all accompanying reports, and required certifications are true accurate and complete.

I declare, under penalty of perjury under the laws of the state of California, that the forgoing is correct and true:


Signature of Responsible Official

5/19/2011
Date

Robert Boston
Name of Responsible Official (please print)

Manager, EH&S
Title of Responsible Official (please print)

APPENDIX F

Quarterly Net Emissions Change

Quarterly Net Emissions Change (QNEC)

The Quarterly Net Emissions Change is used to complete the emission profile screen for the District's PAS database. The QNEC shall be calculated as follows:

QNEC = PE2 - PE1, where:

- QNEC = Quarterly Net Emissions Change for each emissions unit, lb/qtr.
- PE2 = Post Project Potential to Emit for each emissions unit, lb/qtr.
- PE1 = Pre-Project Potential to Emit for each emissions unit, lb/qtr.

Using the values in Sections VII.C.2 and VII.C.6 in the evaluation above, quarterly PE2 and quarterly PE1 for TEOR operation S-1246-296 can be calculated as follows:

$$\begin{aligned}
 PE2_{\text{quarterly}} &= PE2_{\text{annual}} \div 4 \text{ quarters/year} \\
 &= 246,485 \text{ lb-VOC/year} \div 4 \text{ qtr/year} \\
 &= 52,177 \text{ lb-VOC/qtr}
 \end{aligned}$$

$$\begin{aligned}
 PE1_{\text{quarterly}} &= PE1_{\text{annual}} \div 4 \text{ quarters/year} \\
 &= 208,707 \text{ lb-VOC/year} \div 4 \text{ qtr/year} \\
 &= 61,621 \text{ lb-VOC/qtr}
 \end{aligned}$$

S-1246-296 Quarterly NEC [QNEC]			
	PE2 (lb/qtr)	PE1 (lb/qtr)	QNEC (lb/qtr)
NO _x	0	0	0
SO _x	0	0	0
PM ₁₀	0	0	0
CO	0	0	0
VOC	61,621	52,177	9,444

S-1246-364-0, '365-0, '366-0, '367-0, and '368-0 Quarterly NEC [QNEC]			
	PE2 (lb/qtr)	PE1 (lb/qtr)	QNEC (lb/qtr)
NO _x	1489	0	1489
SO _x	931	0	931
PM ₁₀	1024	0	1024
CO	4840	0	4840
VOC	1024	0	1024

APPENDIX G

Tank Emissions Spreadsheet



Tank Input Data	
permit number (S-xxxx-xx-xx)	S-1246-215
facility tank I.D.	—
nearest city (1: Bakersfield, 2: Fresno, 3: Stockton)	1
tank ROC vapor pressure (psia)	0.5
liquid bulk storage temperature, Tb (°F)	180
is this a constant-level tank? {yes, no}	no
will flashing losses occur in this tank (only if first-line tank)? {yes, no}	no
breather vent pressure setting range (psi)	0.06
diameter of tank (feet)	26.7
capacity of tank (bbl)	1,600
conical or dome roof? {c, d}	c
shell height of tank (feet)	16
average liquid height (feet)	8
are the roof and shell the same color? {yes,no}	yes
For roof:	
color {1:Spec Al, 2:Diff Al, 3:Light, 4:Med, 5:Red, 6:White}	4
condition {1: Good, 2: Poor}	1
-----This row only used if shell is different color from roof-----	3
-----This row only used if shell is different color from roof-----	1

Liquid Input Data	A	B
maximum daily fluid throughput (bbl)		3,200
maximum annual fluid throughput (bbl)	1,168,000	1,168,000
-----This row only used if flashing losses occur in this tank-----		100
-----This row only used if flashing losses occur in this tank-----		36,500
molecular weight, Mw (lb/lb-mol)		100

Calculated Values	A	B
daily maximum ambient temperature, T _{ax} (°F)		77.65
daily minimum ambient temperature, T _{an} (°F)		53.15
daily total solar insolation factor, I (Btu/ft ² -day)		1648.9
atmospheric pressure, Pa (psia)		14.47
water vapor pressure at daily maximum liquid surface temperature (T _{ix}), P _{vx} (psia)	143.8	3.2094
water vapor pressure at daily minimum liquid surface temperature (T _{in}), P _{vn} (psia)	133.0	2.4283
water vapor pressure at average liquid surface temperature (T _{ia}), P _{va} (psia)	138.4	2.7876
roof outage, H _{ro} (feet)		0.2781
vapor space volume, V _v (cubic feet)		4634.94
paint factor, alpha		0.68
vapor density, W _v (lb/cubic foot)		0.0078
daily vapor temperature range, delta T _v (degrees Rankine)		49.04
vapor space expansion factor, K _e		0.1437

Result	lb/year	lb/day
Standing Storage Loss	1,892	5.18
Working Loss	58,400	160.00
Flashing Loss	N/A	N/A
Total Uncontrolled Tank VOC Emissions	60,292	165.2



Summary Table	
Permit Number	S-1246-215
Facility Tank I.D.	--
Tank capacity (bbl)	1,600
Tank diameter (ft)	26.7
Tank shell height (ft)	16
Conical or Dome Roof	Conical
Maximum Daily Fluid Throughput (bbl/day)	3,200
Maximum Annual Fluid Throughput (bbl/year)	1,168,000
Maximum Daily Oil Throughput (bbl/day)	N/A
Maximum Annual Oil Throughput (bbl/year)	N/A
Total Uncontrolled Daily Tank VOC Emissions (lb/day)	165.2
Total Uncontrolled Annual Tank VOC Emissions (lb/year)	60,292

APPENDIX H

Fugitive Emissions Spreadsheets

APPENDIX H

Fugitive Emissions Spreadsheets & Federal Major Source PM10 Emission

Berry Petroleum Company
S-1111978, Increase in Fugitive Emissions



Fugitive Emissions Using Screening Emission Factors

California Implementation Guidelines for Estimating Mass Emissions
of Fugitive Hydrocarbon Leaks at Petroleum Facilities

*Table IV-2c. Oil and Gas Production
Screening Value Ranges Emission Factors*

Percentage of components with $\geq 10,000$ ppmv leaks allowed? 0 %
Weight percentage of VOC in the total organic compounds in gas (neglect non-organics)? 100 %
Weight percentage of VOC in the total organic compounds in oil (neglect non-organics)? 100 %

Equipment Type	Service	Component Count	Total allowable leaking components	Screening Value: EF * TOC		VOC emissions (lb/day)
				< 10,000 ppmv (lb/day/source)	$\geq 10,000$ ppmv (lb/day/source)	
Valves	Gas/Light Liquid	2,238	12	1.852E-03	7.333E+00	92.12
	Light Crude Oil	0	0	1.005E-03	3.741E+00	0.00
	Heavy Crude Oil	0	0	7.408E-04	N/A*	0.00
Pump Seals	Gas/Light Liquid	9	0	5.270E-02	4.709E+00	0.47
	Light Crude Oil	0	0	1.402E-02	4.709E+00	0.00
	Heavy Crude Oil	0	0	N/A	N/A	N/A
Others	Gas/Light Liquid	6	0	7.778E-03	7.281E+00	0.05
	Light Crude Oil	0	0	6.931E-03	3.757E-01	0.00
	Heavy Crude Oil	0	0	3.016E-03	N/A*	0.00
Connectors	Gas/Light Liquid	13,652	0	6.349E-04	1.370E+00	8.67
	Light Crude Oil	0	0	5.291E-04	1.238E+00	0.00
	Heavy Crude Oil	0	0	4.233E-04	4.233E-04	0.00
Flanges	Gas/Light Liquid	1,450	0	1.482E-03	3.228E+00	2.15
	Light Crude Oil	0	0	1.270E-03	1.376E+01	0.00
	Heavy Crude Oil	0	0	1.217E-03	N/A*	0.00
Open-ended Lines	Gas/Light Liquid	0	0	1.270E-03	2.905E+00	0.00
	Light Crude Oil	0	0	9.524E-04	1.175E+00	0.00
	Heavy Crude Oil	0	0	7.937E-04	3.762E+00	0.00

* Emission factor not available. All components from equipment type and service will be assessed as < 10,000 ppmv

Total VOC Emissions = 103.5 lb/day

**Equipment Included in Contiguous and Adjaent Property
For North Midway Sunset (MMWSS) Development Project**

Permit	Permit No.				Lease	Field	Comments	Unit Type	Pm Emissions	Total PM
	S	1246								
PTO	S	1246	24	31	Pan Fee	NMWSS		SG	Y	1007
PTO	S	1246	109	4	Alford Elliot	NMWSS		Tank	N	
PTO	S	1246	110	4	Alford Elliot	NMWSS		tank	N	
PTO	S	1246	116	9	Belgian	NMWSS		SG	Y	1095
PTO	S	1246	149	3	Fairfield A2	NMWSS		tank	N	
PTO	S	1246	150	3	Fairfield A2	NMWSS		Tank	N	
PTO	S	1246	152	9	Fairfield A1	NMWSS		Tank	N	
PTO	S	1246	153	6	Fairfield A1	NMWSS		Tank	N	
PTO	S	1246	154	6	Fairfield A1	NMWSS		Tank	N	
PTO	S	1246	155	6	Fairfield A1	NMWSS		Tank	N	
PTO	S	1246	158	5	Fairfield A1	NMWSS		Tank	N	
PTO	S	1246	159	3	Fairfield A1	NMWSS		Tank	N	
PTO	S	1246	171	8	Pan Fee	NMWSS		heater treat	Y	15
PTO	S	1246	172	4	Pan Fee	NMWSS		tank	N	
PTO	S	1246	173	4	Pan Fee	NMWSS		tank	N	
PTO	S	1246	174	4	Pan Fee	NMWSS		tank	N	
PTO	S	1246	175	4	Pan Fee	NMWSS		Tank	N	
PTO	S	1246	183	3	Alford Elliot	NMWSS		Tank	N	
PTO	S	1246	200	3	USL 12	NMWSS		Tank	N	
PTO	S	1246	201	3	USL 12	NMWSS		Tank	N	
PTO	S	1246	292	14	Severini	NMWSS		SG	Y	5659
PTO	S	1246	293	13	Pan Fee	NMWSS		SG	Y	5659
ATC	S	1246	294	11	Pan Fee	NMWSS	ATC '-11 to implement	SG	Y	5659
ATC	S	1246	296	28	MN	NMWSS	Implement 28	TEOR	N	
PTO	S	1246	305	3	Pan Fee	NMWSS		Tank	N	
PTO	S	1246	306	3	Pan Fee	NMWSS		Tank	N	
PTO	S	1246	307	3	Pan Fee	NMWSS		Tank	N	
PTO	S	1246	308	3	Pan Fee	NMWSS		Tank	N	

**Equipment Included in Contiguous and Adjaent Property
For North Midway Sunset (MMWSS) Development Project**

Permit	Permit No.				Lease	Field	Comments	Unit Type	Pm Emissions	Total PM
ATC	S	1246	314	7	Southwestern	NMWSS	ATC '-7 to implement	SG	Y	5659
PTO	S	1246	318	6	Severini	NMWSS		SG	Y	5659
PTO	S	1246	319	3	Severini	NMWSS		SG	Y	5659
PTO	S	1246	320	3	Southwestern	NMWSS		SG	Y	5659
PTO	S	1246	321	3	Southwestern	NMWSS		SG	Y	5659
PTO	S	1246	334	3	Fairfield A1	NMWSS		Tank	N	
PTO	S	1246	335	1	Fairfield A1	NMWSS		Tank	N	
PTO	S	1246	336	1	Fairfield A1	NMWSS		Tank	N	
PTO	S	1246	337	1	Pan Fee	NMWSS		Tank	N	
PTO	S	1246	339	2	Southwestern	NMWSS		Tank	N	
PTO	S	1246	340	3	Southwestern	NMWSS		SG	Y	5659
ATC	S	1246	341	0	Fairfield	NMWSS	Issued 10/1/2010	Tank	N	
PTO	S	1246	342	1	Southwestern	NMWSS		SG	Y	5659

**Equipment Included in Contiguous and Adjacent Property
For North Midway Sunset (MMWSS) Development Project**

Permit	Permit No.				Lease	Field	Comments	Unit Type	Pm Emissions	Total PM
PTO	S	1246	343	1	Southwestern	NMWSS		SG	Y	5659
PTO	S	1246	344	2	Southwestern	NMWSS		SG	Y	5659
ATC	S	1246	347	0	Tidewater	NMWSS	Issued 4/23/2013	SG	Y	3723
ATC	S	1246	348	0	Tidewater	NMWSS	Issued 4/23/2013	SG	Y	3723
ATC	S	1246	349	0	Southwestern	NMWSS	Issued 4/23/2013	SG	Y	3723
ATC	S	1246	350	0	Southwestern	NMWSS	Issued 4/23/2013	SG	Y	3723
PTO	S	1246	351	1	Fairfield A1	NMWSS	Formerly S-1246-119	SG	Y	1997
PTO	S	1246	355	0	Southwestern	NMWSS		SG	Y	3723
PTO	S	1246	356	0	Southwestern	NMWSS		SG	Y	3723
PTO	S	1246	357	0	Southwestern	NMWSS		SG	Y	3723
PTO	S	1246	358	0	Southwestern	NMWSS		SG	Y	3723
PTO	S	1246	359	0	Southwestern	NMWSS		SG	Y	3723
ATC	S	1246	362	0	Southwestern	NMWSS	Issued 5/24/2012	SG	Y	3723
ATC	S	1246	363	0	Southwestern	NMWSS	Issued 5/24/2012	SG	Y	3723
ATC	S	1246	369	0	Southwestern	NMWSS	Issued 5/24/2012	SG	Y	3723
ATC	S	1246	371	0	Southwestern	NMWSS	Issued on 7/11/2012	Tank	N	
ATC	S	1246	374	0	Fairfield	NMWSS	Issued 10/25/2012	Tank	N	
Total PM10 emissions										116698

APPENDIX I

Draft Authorities to Construct

San Joaquin Valley
Air Pollution Control District

AUTHORITY TO CONSTRUCT

ISSUANCE DATE: DRAFT
DRAFT

PERMIT NO: S-1246-296-23

LEGAL OWNER OR OPERATOR: BERRY PETROLEUM COMPANY
MAILING ADDRESS: 5201 TRUXTUN AVENUE SUITE 100
ATTN: EH&S MANAGER
BAKERSFIELD, CA 93309-0422

LOCATION: HEAVY OIL WESTERN STATIONARY SOURCE
KERN COUNTY, CA

SECTION: 02 TOWNSHIP: 31S RANGE: 22E

EQUIPMENT DESCRIPTION:

MODIFICATION OF THERMALLY ENHANCED OIL RECOVERY (TEOR) OPERATION WELL VENT VAPOR CONTROL SYSTEM SERVING 1350 WELLS INCLUDING GAS/LIQUID SEPARATORS, HEAT EXCHANGERS, COMPRESSORS, INLET SEPARATOR VESSELS, CONDENSATE PUMPS, SULFUR SCRUBBER, VAPOR PIPING FROM TANKS '337 AND '339 AND VAPOR PIPING TO STEAM GENERATORS S-1246-3, '-24, '-46, '-119, '-292, '-293, '-342, '343, '344, '345, '346 AND/OR DOGGR APPROVED GAS DISPOSAL WELLS (NMWSS): INCREASE WELL COUNT BY 260 WELLS

CONDITIONS

1. {1830} This Authority to Construct serves as a written certificate of conformity with the procedural requirements of 40 CFR 70.7 and 70.8 and with the compliance requirements of 40 CFR 70.6(c). [District Rule 2201] Federally Enforceable Through Title V Permit
2. {1831} Prior to operating with modifications authorized by this Authority to Construct, the facility shall submit an application to modify the Title V permit with an administrative amendment in accordance with District Rule 2520 Section 5.3.4. [District Rule 2520, 5.3.4] Federally Enforceable Through Title V Permit
3. Prior to startup of the equipment authorized by this Authority to Construct, Permit to Operate S-1246-215 shall be surrendered to the District and the associated equipment shall be removed or rendered inoperable. [District Rule 2201] Federally Enforceable Through Title V Permit
4. No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]
5. TEOR operation is authorized to operate at the following locations: Sections 1, 2, 3, 11, and 12 T31S, R22E. [District Rule 2201] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (661) 392-5500 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT. This is NOT a PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, this Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

Seyed Sadredin, Executive Director, APCO

DRAFT

DAVID WARNER, Director of Permit Services

S-1246-296-23 : Jun 12 2013 9:21AM - DAVIDDGG : Joint Inspection NOT Required

6. Well vent vapor from this TEOR operation shall only be incinerated in approved steam generators or disposed of in DOGGR approved gas disposal wells. [District Rule 2201] Federally Enforceable Through Title V Permit
7. Well vent vapor from this TEOR operation shall not be incinerated in approved steam generators unless it is first scrubbed in a fuel gas sulfur scrubber and sulfur compounds are reduced by a minimum of 95%. [District Rule 2201] Federally Enforceable Through Title V Permit
8. Compliance with scrubber sulfur removal efficiency requirement shall be demonstrated by measurement of total sulfur compound concentrations at scrubber inlet and outlet. The measurement shall be conducted on grab samples taken at scrubber inlet and outlet using one of the following test methods: ASTM D3246 or double GC for H₂S and mercaptans, or equivalent test method with prior District approval. Grab samples shall be taken and analyzed upon initial use of the scrubber and, thereafter, every six months. If scrubber is not in use at six-month anniversary date, then efficiency shall be demonstrated within two weeks of returning scrubber to service. For each month in which scrubber is operated and laboratory analysis of grab samples is not required, operator shall monitor and adjust scrubber performance as needed using gas-detection tubes calibrated for existing sulfur species or other equivalent District approved sulfur detection method(s) or device(s). [District Rule 2201] Federally Enforceable Through Title V Permit
9. Well vent vapor collection and control system includes piping from sulfur scrubbers to District approved incinerating devices. Well vent vapor collection and control system includes bypass piping around sulfur scrubbers to DOGGR-approved vapor disposal well(s). [District Rule 2201] Federally Enforceable Through Title V Permit
10. Fugitive VOC emissions rate for the TEOR operation, calculated using CAPCOA California Implementation Guidelines for Estimating Mass Emissions of Fugitive Hydrocarbon Leaks at Petroleum Facilities, Table IV-2c, Oil and Gas Production Screening Value Ranges Emission Factors (Feb 1999) and the total number of components in gas/light liquid service, shall not exceed 688.1 lb-VOC/day. [District Rule 2201] Federally Enforceable Through Title V Permit
11. During the time any steam-enhanced crude oil production well is undergoing service or repair while the well is not producing, it shall be exempt from the emission control requirements of District Rule 4401. [District Rules 2410 and 4401] Federally Enforceable Through Title V Permit
12. The inspection requirements of Section 5.4.1 through Section 5.4.7 of Rule 4401 shall not apply to components exclusively handling gas/vapor or liquid with a VOC content of ten percent by weight (10%) or less, as determined by the test methods in Section 6.3.4 of Rule 4401. Federally Enforceable Through Title V Permit
13. Gas and liquid leaks are as defined in Section 3.20 of Rule 4401. [District Rules 2410 and 4401] Federally Enforceable Through Title V Permit
14. An operator shall not operate a steam-enhanced crude oil production well unless the operator complies with either of the following requirements: The steam-enhanced crude oil production well vent is closed and the front line production equipment downstream of the wells that carry produced fluids (crude oil or mixture of crude oil and water) is connected to a VOC collection and control system as defined in Section 3.0 of Rule 4401, the well vent may be temporarily opened during periods of attended service or repair of the well provided such activity is done as expeditiously as possible with minimal spillage of material and VOC emissions to the atmosphere, or the steam-enhanced crude oil production well vent is open and the well vent is connected to a VOC collection and control system as defined in Section 3.0 of Rule 4401. [District Rules 2410 and 4401] Federally Enforceable Through Title V Permit
15. An operator shall be in violation of this rule if any District inspection demonstrates or if any operator inspection conducted pursuant to Section 5.4 of Rule 4401 demonstrates the existence of an open-ended line or a valve located at the end of the line that is not sealed with a blind flange, plug, cap, or a second closed valve that is not closed at all times, except during attended operations as defined by Section 5.2.2.1 of Rule 4401 requiring process fluid flow through the open-ended lines, a component with a major liquid leak, or a component with a gas leak greater than 50,000 ppmv. [District Rules 2410 and 4401] Federally Enforceable Through Title V Permit
16. An operator shall be in violation of this rule if any District inspection demonstrates or if any operator inspection conducted pursuant to Section 5.4 of Rule 4401 demonstrates the existence of any combination of components with minor liquid leaks, minor gas leaks, or a gas leaks greater than 10,000 ppmv up to 50,000 ppmv that totals more than number of leaks allowed by Table 2 of Rule 4401. [District Rules 2410 and 4401] Federally Enforceable Through Title V Permit

DRAFT
CONDITIONS CONTINUE ON NEXT PAGE

17. An operator shall not use any component with a leak as defined in Section 3.0 of Rule 4401, or that is found to be in violation of the provisions of Section 5.2.2 of Rule 4401. However, components that were found leaking may be used provided such leaking components have been identified with a tag for repair, are repaired, or awaiting re-inspection after being repaired within the applicable time frame specified in Section 5.5 of Rule 4401. [District Rules 2410 and 4401] Federally Enforceable Through Title V Permit
18. Each hatch shall be closed at all times except during sampling or adding of process material through the hatch, or during attended repair, replacement, or maintenance operations, provided such activities are done as expeditiously as possible with minimal spillage of material and VOC emissions to the atmosphere. [District Rules 2410 and 4401] Federally Enforceable Through Title V Permit
19. An operator shall comply with the requirements of Section 6.7 of Rule 4401 if there is any change in the description of major components or critical components. [District Rules 2410 and 4401] Federally Enforceable Through Title V Permit
20. Except for pipes and unsafe-to-monitor components, an operator shall inspect all other components pursuant to the requirements of Section 6.3.3 of Rule 4401 at least once every year. [District Rules 2410 and 4401] Federally Enforceable Through Title V Permit
21. An operator shall visually inspect all pipes at least once every year. Any visual inspection of pipes that indicates a leak that cannot be immediately repaired to meet the leak standards of this rule shall be inspected within 24 hours after detecting the leak. If a leak is found, the leak shall be repaired as soon as practicable but not later than the time frame specified in Table 3 of Rule 4401. [District Rules 2410 and 4401] Federally Enforceable Through Title V Permit
22. In addition to the inspections required by Section 5.4.1 of Rule 4401, an operator shall inspect for leaks all accessible operating pumps, compressors, and PRDs in service as follows: An operator shall audio-visually (by hearing and by sight) inspect for leaks all accessible operating pumps, compressors, and PRDs in service at least once each calendar week. Any audio-visual inspection of an accessible operating pump, compressor, and PRD performed by an operator that indicates a leak that cannot be immediately repaired to meet the leak standards of this rule shall be inspected not later than 24 hours after conducting the audio-visual inspection. If a leak is found, the leak shall be repaired as soon as practicable but not later than the time frame specified in Table 3 of Rule 4401. [District Rules 2410 and 4401] Federally Enforceable Through Title V Permit
23. In addition to the inspections required by Sections 5.4.1, 5.4.2 and 5.4.3 of Rule 4401, operator shall perform the following: initially inspect a PRD that releases to the atmosphere as soon as practicable but not later than 24 hours after the discovery of the release, re-inspect the PRD not earlier than 24 hours after the initial inspection but not later than 15 calendar days after the initial inspection, inspect all new, replaced, or repaired fittings, flanges, and threaded connections within 72 hours of placing the component in service. Except for PRDs subject to the requirements of Section 5.4.4.1 of Rule 4401, an operator shall inspect a component that has been repaired or replaced not later than 15 calendar days after the component was repaired or replaced. [District Rules 2410 and 4401] Federally Enforceable Through Title V Permit
24. An operator shall inspect all unsafe-to-monitor components during each turnaround. [District Rules 2410 and 4401] Federally Enforceable Through Title V Permit
25. District inspection in no way fulfills any of the mandatory inspection requirements that are placed upon operators and cannot be used or counted as an inspection required of an operator. [District Rules 2410 and 4401] Federally Enforceable Through Title V Permit
26. An operator shall affix a readily visible weatherproof tag to a leaking component upon detection of the leak and shall include the following information on the tag: date and time of leak detection, date and time of leak measurement, for a gaseous leak, the leak concentration in ppmv, for a liquid leak, whether it is a major liquid leak or a minor liquid leak, whether the component is an essential component, an unsafe-to monitor component, or a critical component. [District Rules 2410 and 4401] Federally Enforceable Through Title V Permit
27. An operator shall keep the tag affixed to the component until an operator has met all of the following conditions: repaired or replaced the leaking component, re-inspected the component using the test method in Section 6.3.3, and the component is found to be in compliance with the requirements of this rule. [DISTRICT Rules 2410 and 4401] Federally Enforceable Through Title V Permit

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CONDITIONS CONTINUE ON NEXT PAGE

28. An operator shall minimize a component leak in order to stop or reduce leakage to the atmosphere immediately to the extent possible, but not later than one (1) hour after detection of the leak. [District Rule 4401, 5.5] Federally Enforceable Through Title V Permit
29. Except for leaking critical components or leaking essential components subject to the requirements of Section 5.5.7 of Rule 4401, if an operator has minimized a leak but the leak still exceeds the applicable leak limits as defined in Section 3.0 of Rule 4401, an operator shall comply with at least one of the following requirements as soon as practicable but not later than the time period specified in Table 3 of Rule 4401: Repair or replace the leaking component; or vent the leaking component to a VOC collection and control system as defined in Section 3.0 of Rule 4401, or remove the leaking component from operation. [District Rules 2410 and 4401] Federally Enforceable Through Title V Permit
30. The repair period in calendar days shall not exceed 14 days for minor gas leaks, 5 days for major gas leaks less than or equal to 50,000 ppmv, 2 days for gas leak greater than 50,000 ppmv, 3 days for minor liquid leaks, 2 days for major liquid leaks. Federally Enforceable Through Title V Permit
31. The leak rate measured after leak minimization has been performed shall be the leak rate used to determine the applicable repair period specified in Table 3 of Rule 4401. [District Rules 2410 and 4401] Federally Enforceable Through Title V Permit
32. The time of the initial leak detection shall be the start of the repair period specified in Table 3 of Rule 4401. [District Rules 2410 and 4401] Federally Enforceable Through Title V Permit
33. If the leaking component is an essential component or a critical component that cannot be immediately shut down for repairs, and if the leak has been minimized but the leak still exceeds the applicable leak standard of this rule, the operator shall repair or replace the essential component or critical component to eliminate the leak during the next process unit turnaround, but in no case later than one year from the date of the original leak detection, whichever comes earlier. [District Rules 2410 and 4401] Federally Enforceable Through Title V Permit
34. The operator of any steam-enhanced crude oil production well shall maintain records of the date and well identification where steam injection or well stimulation occurs. [District Rules 2410 and 4401] Federally Enforceable Through Title V Permit
35. An operator of any steam-enhanced crude oil production well shall keep source test records which demonstrate compliance with the control efficiency requirements of the VOC collection and control system as defined in Section 3.0 of Rule 4401. [District Rules 2410 and 4401] Federally Enforceable Through Title V Permit
36. Operator of any steam-enhanced crude oil production well shall keep an inspection log maintained pursuant to Section 6.4 of Rule 4401. [District Rules 2410 and 4401] Federally Enforceable Through Title V Permit
37. Records of each calibration of the portable hydrocarbon detection instrument utilized for inspecting components, including a copy of current calibration gas certification from the vendor of said calibration gas cylinder, the date of calibration, concentration of calibration gas, instrument reading of calibration gas before adjustment, instrument reading of calibration gas after adjustment, calibration gas expiration date, and calibration gas cylinder pressure at the time of calibration shall be maintained. [District Rules 2410 and 4401] Federally Enforceable Through Title V Permit
38. An operator shall maintain copies at the facility of the training records of the training program operated pursuant to Section 6.5 of Rule 4401. [District Rules 2410 and 4401] Federally Enforceable Through Title V Permit
39. The results of gauge tank TVP testing conducted pursuant to Section 6.2.3 shall be submitted to the APCO within 60 days after the completion of the testing. [District Rules 2410 and 4401] Federally Enforceable Through Title V Permit
40. An operator that discovers that a PRD has released shall record the date that the release was discovered, and the identity and location of the PRD that released. An operator shall submit such information recorded during the calendar year to the APCO no later than 60 days after the end of the calendar year. [District Rules 2410 and 4401] Federally Enforceable Through Title V Permit
41. An operator shall source test annually all vapor collection and control systems used to control emissions from steam-enhanced crude oil production well vents to determine the control efficiency of the device(s) used for destruction or removal of VOC. Compliance testing shall be performed annually by source testers certified by ARB. Testing shall be performed during June, July, August, or September of each year if the system's control efficiency is dependent upon ambient air temperature. A process system as defined in Section 3.30 of Rule 4401 is not subject to compliance source testing requirements. [District Rules 2410 and 4401] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

42. If approved by EPA, ARB, and the APCO, an operator need not comply with the annual testing requirement of Section 6.2.1 if all uncondensed VOC emissions collected by a vapor collection are controlled by an internal combustion engine subject to Rule 4702, a combustion device subject to Rule 4320, 4307 or 4308, a flare subject to Rule 4311. [District Rules 2410 and 4401] Federally Enforceable Through Title V Permit
43. An operator shall comply with the following requirements for each gauge tank, as defined in Section 3.0 of Rule 4401: Conduct periodic TVP testing of each gauge tank at least once every 24 months during summer (July - September), and whenever there is a change in the source or type of produced fluid in the gauge tank. The TVP testing shall be conducted at the actual storage temperature of the produced fluid in the gauge tank using the applicable TVP test method specified in Section 6.4 of Rule 4623 (Storage of Organic Liquids). The operator shall submit the TVP testing results to the APCO as specified in Section 6.1.9 of Rule 4401. [District Rules 2410 and 4401] Federally Enforceable Through Title V Permit
44. The control efficiency of any VOC control device, measured and calculated as carbon, shall be determined by EPA Method 25, except when the outlet concentration must be below 50 ppm in order to meet the standard, in which case EPA Method 25a may be used. EPA Method 18 may be used in lieu of EPA Method 25 or EPA Method 25a provided the identity and approximate concentrations of the analytes/compounds in the sample gas stream are known before analysis with the gas chromatograph and the gas chromatograph is calibrated for each of those known analyte/compound to ensure that the VOC concentrations are neither under- or over-reported. [District Rules 2410 and 4401] Federally Enforceable Through Title V Permit
45. VOC content shall be analyzed by using the latest revision of ASTM Method E168, E169, or E260 as applicable. Analysis of halogenated exempt compounds shall be performed by using ARB Method 432. [District Rules 2410 and 4401] Federally Enforceable Through Title V Permit
46. Leak inspection, other than audio-visual, and measurements of gaseous leak concentrations shall be conducted according to EPA Method 21 using an appropriate portable hydrocarbon detection instrument calibrated with methane. The instrument shall be calibrated in accordance with the procedures specified in EPA Method 21 or the manufacturer's instruction, as appropriate, not more than 30 days prior to its use. The operator shall record the calibration date of the instrument. Where safety is a concern, such as measuring leaks from compressor seals or pump seals when the shaft is rotating, a person shall measure leaks by placing the instrument probe inlet at a distance of one (1) centimeter or less from the surface of the component interface. [District Rules 2410 and 4401] Federally Enforceable Through Title V Permit
47. The VOC content by weight percent (wt.%) shall be determined using American Society of Testing and Materials (ASTM) D1945 for gases and South Coast Air Quality Management District (SCAQMD) Method 304-91 or the latest revision of ASTM Method E168, E169 or E260 for liquids. [District Rules 2410 and 4401] Federally Enforceable Through Title V Permit
48. Operator shall maintain an inspection log in which an operator records, at a minimum, all of the following information for each inspection performed: The total number of components inspected, total number and percentage of leaking components found by component type, location, type, and name or description of each leaking component and description of any unit where the leaking component is found, date of leak detection and the method of leak detection. For gaseous leaks, the leak concentration in ppmv, and for liquid leaks record whether the leak is a major liquid leak or a minor liquid leak. the date of repair, replacement, or removal from operation of leaking components, identify and location of essential components and critical components found leaking that cannot be repaired until the next process unit turnaround or not later than one year after leak detection, whichever comes earlier, methods used to minimize the leak from essential components and critical components found leaking that cannot be repaired until the next process unit turnaround or not later than one year after leak detection, whichever comes earlier, the date of re-inspection and the leak concentration in ppmv after the component is repaired or is replaced, the inspector's name, business mailing address, and business telephone number, date and signature of the facility operator responsible for the inspection and repair program certifying the accuracy of the information recorded in the log. [District Rules 2410 and 4401] Federally Enforceable Through Title V Permit
49. Operator shall keep a copy of the APCO-approved Operator Management Plan at the facility. [District Rules 2410 and 4401] Federally Enforceable Through Title V Permit

50. Operator shall keep a list of all gauge tanks, as defined in Section 3.0 of Rule 4401. The list shall contain the size, identification number, the location of each gauge tank and specify whether the gauge tank is upstream of all front line production equipment. [District Rules 2410 and 4401] Federally Enforceable Through Title V Permit
51. By January 30 of each year, an operator shall submit to the APCO for approval, in writing, an annual report indicating any changes to an existing Operator Management Plan. [District Rules 2410 and 4401] Federally Enforceable Through Title V Permit
52. All records of required monitoring data and support information shall be maintained for a period of at least five years and shall be made readily available for District inspection upon request. [District Rules 2410 and 4401] Federally Enforceable Through Title V Permit
53. Source testing shall be conducted using the methods and procedures approved by the District. The District must be notified at least 30 days prior to any compliance source test, and a source test plan must be submitted for approval at least 15 days prior to testing. [District Rule 1081] Federally Enforceable Through Title V Permit
54. Collected vapors shall be disposed of in District approved incineration devices, as listed on this permit, or in Department of Oil, Gas and Geothermal Resources (DOGGR) approved vapor disposal wells. Permittee shall make documentation of DOGGR approval for injection wells readily available for District inspection upon request. [District Rule 2201] Federally Enforceable Through Title V Permit
55. The operator shall maintain records of the fugitive component count and calculated VOC emissions. [District Rule 2201] Federally Enforceable Through Title V Permit
56. Permittee shall maintain a written record of inlet and outlet sulfur compound measurements and recharging dates and such records shall be made readily available for District inspection upon request. [District Rule 2201] Federally Enforceable Through Title V Permit
57. Permittee shall maintain with the permit a current listing of all steam enhanced wells with casing vents connected to the well vent collection and control system. [District Rules 1070 and 2520, 9.3.2] Federally Enforceable Through Title V Permit
58. All records shall be maintained and retained on-site for a minimum of five (5) years, and shall be made available for District inspection upon request. [District Rule 1070] Federally Enforceable Through Title V Permit

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San Joaquin Valley
Air Pollution Control District

AUTHORITY TO CONSTRUCT

ISSUANCE DATE: DRAFT

PERMIT NO: S-1246-364-0

LEGAL OWNER OR OPERATOR: BERRY PETROLEUM COMPANY
MAILING ADDRESS: 5201 TRUXTUN AVENUE SUITE 100
ATTN: EH&S MANAGER
BAKERSFIELD, CA 93309-0422

LOCATION: HEAVY OIL WESTERN STATIONARY SOURCE
KERN COUNTY, CA

EQUIPMENT DESCRIPTION:

85 MMBTU/HR NATURAL/ETHANE-RICH NATURAL/TEOR/TVR GAS-FIRED STEAM GENERATOR (MJN-437) WITH A NORTH AMERICAN MAGNA FLAME LE ULTRA LOW NOX BURNER, FLUE GAS RECIRCULATION (FGR) AND AN O2 CONTROLLER

CONDITIONS

1. {1830} This Authority to Construct serves as a written certificate of conformity with the procedural requirements of 40 CFR 70.7 and 70.8 and with the compliance requirements of 40 CFR 70.6(c). [District Rule 2201] Federally Enforceable Through Title V Permit
2. {1831} Prior to operating with modifications authorized by this Authority to Construct, the facility shall submit an application to modify the Title V permit with an administrative amendment in accordance with District Rule 2520 Section 5.3.4. [District Rule 2520, 5.3.4] Federally Enforceable Through Title V Permit
3. Prior to startup of the equipment authorized by this Authority to Construct, Permit to Operate S-1246-215 shall be surrendered to the District and the associated equipment shall be removed or rendered inoperable. [District Rule 2201] Federally Enforceable Through Title V Permit
4. Prior to operating equipment under this Authority to Construct, permittee shall surrender NOX emission reduction credits for the following quantity of emissions: 1st quarter - 2,234 lb, 2nd quarter - 2,234 lb, 3rd quarter - 2,234 lb, and fourth quarter - 2,234 lb. These amounts include the applicable offset ratio specified in Rule 2201 Section 4.8 (as amended 4/21/11) for the ERC specified below. [District Rule 2201] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (661) 392-5600 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT. This is NOT a PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, this Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

Sayed Sadredin, Executive Director APCO

DAVID WARNER, Director of Permit Services
9-1246-364-0 : May 21 2013 2:40PM - DAVIDS06 : Joint Inspection NOT Required

5. Prior to operating equipment under this Authority to Construct, permittee shall surrender SOX emission reduction credits for the following quantity of emissions: 1st quarter -2,932 lb, 2nd quarter - 2,932 lb, 3rd quarter - 2,392 lb, and fourth quarter - 2,392 lb. These amounts include the applicable offset ratio specified in Rule 2201 Section 4.8 (as amended 4/21/11) for the ERC specified below. [District Rule 2201] Federally Enforceable Through Title V Permit
6. ERC Certificate Numbers S-3820-2, and S-3917-5 (or certificates split from these certificates) shall be used to supply the required offsets, unless a revised offsetting proposal is received and approved by the District, upon which this Authority to Construct shall be reissued, administratively specifying the new offsetting proposal. Original public noticing requirements, if any, shall be duplicated prior to reissuance of this Authority to Construct. [District Rule 2201] Federally Enforceable Through Title V Permit
7. No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20% opacity. [District Rule 4101] Federally Enforceable Through Title V Permit
8. All equipment shall be maintained in good operating condition and shall be operated in a manner to minimize emissions of air contaminants into the atmosphere. [District Rule 2201] Federally Enforceable Through Title V Permit
9. This unit shall be equipped with horizontal convection section with at least 235 square feet of bare tube surface area (or thermodynamically equivalent number of square feet of finned tube) per MMBtu/hr of heat input. [District Rule 2410] Federally Enforceable Through Title V Permit
10. This unit shall be equipped with variable frequency drive high efficiency electrical motors driving the blower and water pump. [District Rule 2410] Federally Enforceable Through Title V Permit
11. The unit shall only be fired on natural/TEOR/ethane rich gas with a maximum sulfur content of 1 gr S/100scf. [District Rules 2201, 4301, and 4320] Federally Enforceable Through Title V Permit
12. At least quarterly, the permittee shall monitor using the methods specified in this permit the higher heating value of each non-certified fuel supplied to this unit, or, alternatively, have the higher heating value certified by the fuel supplier. The records of higher heating value and quantity of fuel combusted shall be used to demonstrate that the rated heat input capacity of this unit, as averaged over a calendar quarter, is not exceeded. [District Rules 2201] Federally Enforceable Through Title V Permit
13. The higher heating value of each non-certified fuel shall be certified by a third party fuel supplier or determined by ASTM D1826 or D1945 in conjunction with ASTM D 3588. [District Rules 2201 and 4320] Federally Enforceable Through Title V Permit
14. This unit shall be fired on natural gas or ethane-rich natural gas with a sulfur content that does not exceed 1 gr of sulfur compounds (as S) per 100 scf. [District Rules 2201 and 4320] Federally Enforceable Through Title V Permit
15. Except for periods of startup and shutdown, emissions from the natural gas-fired unit shall not exceed any of the following limits: 7 ppmvd NO_x @ 3% O₂ or 0.008 lb-NO_x/MMBtu, 0.005 lb-PM₁₀/MMBtu, 35 ppmvd CO @ 3% O₂ or 0.026 lb-CO/MMBtu, or 0.0055 lb-VOC/MMBtu. [District Rules 2201, 4201, 4301, 4305, 4306, 4320, and 4801] Federally Enforceable Through Title V Permit
16. Duration of start-up or shutdown shall not exceed two hours each per occurrence. During start-up or shutdown, the emissions control system shall be in operation, and emissions shall be minimized insofar as technologically possible. The operator shall maintain daily records of the duration of start-up and shutdown periods. [District Rules 4305, 4306, and 4320] Federally Enforceable Through Title V Permit
17. Start-up is defined as the period of time during which a unit is brought from a shutdown status to its operating temperature and pressure, including the time required by the unit's emission control system to reach full operation. Shutdown is defined as the period of time during which a unit is taken from an operational to a non-operational status by allowing it to cool down from its operating temperature to ambient temperature as the fuel supply to the unit is completely turned off. [District Rules 4305, 4306, and 4320] Federally Enforceable Through Title V Permit

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CONDITIONS CONTINUE ON NEXT PAGE

18. Source testing to measure natural gas-combustion NOx and CO emissions from this unit shall be conducted within 60 days of initial startup and at least once every twelve (12) months thereafter. After demonstrating compliance on two (2) consecutive annual source tests, the unit shall be tested not less than once every thirty-six (36) months. If the result of the 36-month source test demonstrates that the unit does not meet the applicable emission limits, the source testing frequency shall revert to at least once every twelve (12) months. [District Rules 2201, 4305, 4306, and 4320] Federally Enforceable Through Title V Permit
19. Permittee shall determine sulfur content of combusted gas annually or shall demonstrate that the combusted gas is provided from a PUC or FERC regulated source. [District Rules 1081 and 4320] Federally Enforceable Through Title V Permit
20. The source test plan shall identify which basis (ppmv or lb/MMBtu) will be used to demonstrate compliance. [District Rules 4305, 4306, and 4320] Federally Enforceable Through Title V Permit
21. Source testing shall be conducted using the methods and procedures approved by the District. The District must be notified at least 30 days prior to any compliance source test, and a source test plan must be submitted for approval at least 15 days prior to testing. [District Rule 1081] Federally Enforceable Through Title V Permit
22. The results of each source test shall be submitted to the District within 60 days thereafter. [District Rule 1081] Federally Enforceable Through Title V Permit
23. NOx emissions for source test purposes shall be determined using EPA Method 7E or ARB Method 100 on a ppmv basis, or EPA Method 19 on a heat input basis. [District Rules 4305, 4306, and 4320] Federally Enforceable Through Title V Permit
24. CO emissions for source test purposes shall be determined using EPA Method 10 or ARB Method 100. [District Rules 4305, 4306, and 4320] Federally Enforceable Through Title V Permit
25. Stack gas oxygen (O2) shall be determined using EPA Method 3 or 3A or ARB Method 100. [District Rules 4305, 4306, and 4320] Federally Enforceable Through Title V Permit
26. Fuel sulfur content shall be determined using EPA Method 11 or Method 15. [District Rule 4320] Federally Enforceable Through Title V Permit
27. All emissions measurements shall be made with the unit operating either at conditions representative of normal operations or conditions specified in the Permit to Operate. No determination of compliance shall be established within two hours after a continuous period in which fuel flow to the unit is shut off for 30 minutes or longer, or within 30 minutes after a re-ignition as defined in Section 3.0 of District Rule 4306. [District Rules 4305, 4306, and 4320] Federally Enforceable Through Title V Permit
28. For emissions source testing, the arithmetic average of three 30-consecutive-minute test runs shall apply. If two of three runs are above an applicable limit the test cannot be used to demonstrate compliance with an applicable limit. [District Rules 4305, 4306, and 4320] Federally Enforceable Through Title V Permit
29. Permittee shall determine sulfur content of combusted gas weekly for eight consecutive weeks. After demonstrating compliance for eight consecutive weeks testing may be conducted on a quarterly basis. Weekly sulfur testing shall resume if quarterly testing does not indicate compliance. Weekly gas analysis shall be performed using Draeger tubes and quarterly analysis using ASTM method D3246 or double GC for H2S and mercaptans. First of the weekly gas analyses shall be done using laboratory analysis. [District Rules 1081 and 2201] Federally Enforceable Through Title V Permit
30. Compliance with fuel sulfur limit(s) can be demonstrated either by monitoring sulfur content at location(s) after all fuel sources are combined prior to incineration, or by monitoring the sulfur content and volume of each fuel source and performing mass balance calculations. Records of monitoring locations, detected sulfur concentrations, and mass balance calculations, if necessary, shall be maintained and kept onsite and made readily available for District inspection upon request. [District Rules 1081 and 2201] Federally Enforceable Through Title V Permit
31. The permittee shall monitor and record the stack concentration of NOx, CO, and O2 at least once every month (in which a source test is not performed) using a portable emission monitor that meets District specifications. Monitoring shall not be required if the unit is not in operation, i.e. the unit need not be started solely to perform monitoring. Monitoring shall be performed within 5 days of restarting the unit unless monitoring has been performed within the last month. [District Rules 4305, 4306, and 4320] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

32. If either the NO_x or CO concentrations corrected to 3% O₂, as measured by the portable analyzer, exceed the allowable emissions concentration, the permittee shall return the emissions to within the acceptable range as soon as possible, but no longer than 1 hour of operation after detection. If the portable analyzer readings continue to exceed the allowable emissions concentration after 1 hour of operation after detection, the permittee shall notify the District within the following 1 hour and conduct a certified source test within 60 days of the first exceedance. In lieu of conducting a source test, the permittee may stipulate a violation has occurred, subject to enforcement action. The permittee must then correct the violation, show compliance has been re-established, and resume monitoring procedures. If the deviations are the result of a qualifying breakdown condition pursuant to Rule 1100, the permittee may fully comply with Rule 1100 in lieu of the performing the notification and testing required by this condition. [District Rules 4305, 4306, and 4320] Federally Enforceable Through Title V Permit
33. All alternate monitoring parameter emission readings shall be taken with the unit operating either at conditions representative of normal operations or conditions specified in the Permit to Operate. The analyzer shall be calibrated, maintained, and operated in accordance with the manufacturer's specifications and recommendations or a protocol approved by the APCO. Emission readings taken shall be averaged over a 15 consecutive-minute period by either taking a cumulative 15 consecutive-minute sample reading or by taking at least five (5) readings, evenly spaced out over the 15 consecutive-minute period. [District Rules 4305, 4306, and 4320] Federally Enforceable Through Title V Permit
34. The permittee shall maintain records of: (1) the date and time of NO_x, CO, and O₂ measurements, (2) the O₂ concentration in percent and the measured NO_x and CO concentrations corrected to 3% O₂, (3) make and model of exhaust gas analyzer, (4) exhaust gas analyzer calibration records, and (5) a description of any corrective action taken to maintain the emissions within the acceptable range. [District Rules 4305, 4306, and 4320] Federally Enforceable Through Title V Permit
35. All records shall be maintained and retained on-site for a minimum of five (5) years, and shall be made available for District inspection upon request. [District Rules 1070, 4305, 4306, 4320, and 40 CFR 60.48c(i)] Federally Enforceable Through Title V Permit

DRAFT

San Joaquin Valley
Air Pollution Control District

AUTHORITY TO CONSTRUCT

ISSUANCE DATE: DRAFT
DRAFT

PERMIT NO: S-1246-365-0

LEGAL OWNER OR OPERATOR: BERRY PETROLEUM COMPANY
MAILING ADDRESS: 5201 TRUXTUN AVENUE SUITE 100
ATTN: EH&S MANAGER
BAKERSFIELD, CA 93309-0422

LOCATION: HEAVY OIL WESTERN STATIONARY SOURCE
KERN COUNTY, CA

EQUIPMENT DESCRIPTION:

85 MMBTU/HR NATURAL/ETHANE-RICH NATURAL/TEOR/TVR GAS-FIRED STEAM GENERATOR (MJN-438) WITH A NORTH AMERICAN MAGNA FLAME LE ULTRA LOW NOX BURNER, FLUE GAS RECIRCULATION (FGR) AND AN O2 CONTROLLER

CONDITIONS

1. {1830} This Authority to Construct serves as a written certificate of conformity with the procedural requirements of 40 CFR 70.7 and 70.8 and with the compliance requirements of 40 CFR 70.6(c). [District Rule 2201] Federally Enforceable Through Title V Permit
2. {1831} Prior to operating with modifications authorized by this Authority to Construct, the facility shall submit an application to modify the Title V permit with an administrative amendment in accordance with District Rule 2520 Section 5.3.4. [District Rule 2520, 5.3.4] Federally Enforceable Through Title V Permit
3. Prior to startup of the equipment authorized by this Authority to Construct, Permit to Operate S-1246-215 shall be surrendered to the District and the associated equipment shall be removed or rendered inoperable. [District Rule 2201] Federally Enforceable Through Title V Permit
4. Prior to operating equipment under this Authority to Construct, permittee shall surrender NOX emission reduction credits for the following quantity of emissions: 1st quarter - 2,234 lb, 2nd quarter - 2,234 lb, 3rd quarter - 2,234 lb, and fourth quarter - 2,234 lb. These amounts include the applicable offset ratio specified in Rule 2201 Section 4.8 (as amended 4/21/11) for the ERC specified below. [District Rule 2201] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (661) 392-6500 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT. This is NOT a PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, this Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

Seyed Sadredin, Executive Director, APCO

DRAFT

DAVID WARNER, Director of Permit Services
S-1246-365-0; May 21 2013 2:40PM - DAVIDSOS : Joint Inspection NOT Required

5. Prior to operating equipment under this Authority to Construct, permittee shall surrender SOX emission reduction credits for the following quantity of emissions: 1st quarter -2,932 lb, 2nd quarter - 2,932 lb, 3rd quarter - 2,392 lb, and fourth quarter - 2,392 lb. These amounts include the applicable offset ratio specified in Rule 2201 Section 4.8 (as amended 4/21/11) for the ERC specified below. [District Rule 2201] Federally Enforceable Through Title V Permit
6. ERC Certificate Numbers S-3820-2, and S-3917-5 (or certificates split from these certificates) shall be used to supply the required offsets, unless a revised offsetting proposal is received and approved by the District, upon which this Authority to Construct shall be reissued, administratively specifying the new offsetting proposal. Original public noticing requirements, if any, shall be duplicated prior to reissuance of this Authority to Construct. [District Rule 2201] Federally Enforceable Through Title V Permit
7. No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20% opacity. [District Rule 4101] Federally Enforceable Through Title V Permit
8. All equipment shall be maintained in good operating condition and shall be operated in a manner to minimize emissions of air contaminants into the atmosphere. [District Rule 2201] Federally Enforceable Through Title V Permit
9. This unit shall be equipped with horizontal convection section with at least 235 square feet of bare tube surface area (or thermodynamically equivalent number of square feet of finned tube) per MMBtu/hr of heat input. [District Rule 2410] Federally Enforceable Through Title V Permit
10. This unit shall be equipped with variable frequency drive high efficiency electrical motors driving the blower and water pump. [District Rule 2410] Federally Enforceable Through Title V Permit
11. The unit shall only be fired on natural/TEOR/ethane rich gas with a maximum sulfur content of 1 gr S/100scf. [District Rules 2201, 4301, and 4320] Federally Enforceable Through Title V Permit
12. At least quarterly, the permittee shall monitor using the methods specified in this permit the higher heating value of each non-certified fuel supplied to this unit, or, alternatively, have the higher heating value certified by the fuel supplier. The records of higher heating value and quantity of fuel combusted shall be used to demonstrate that the rated heat input capacity of this unit, as averaged over a calendar quarter, is not exceeded. [District Rules 2201] Federally Enforceable Through Title V Permit
13. The higher heating value of each non-certified fuel shall be certified by a third party fuel supplier or determined by ASTM D1826 or D1945 in conjunction with ASTM D 3588. [District Rules 2201 and 4320] Federally Enforceable Through Title V Permit
14. This unit shall be fired on natural gas or ethane-rich natural gas with a sulfur content that does not exceed 1 gr of sulfur compounds (as S) per 100 scf. [District Rules 2201 and 4320] Federally Enforceable Through Title V Permit
15. Except for periods of startup and shutdown, emissions from the natural gas-fired unit shall not exceed any of the following limits: 7 ppmvd NOx @ 3% O2 or 0.008 lb-NOx/MMBtu, 0.005 lb-PM10/MMBtu, 35 ppmvd CO @ 3% O2 or 0.026 lb-CO/MMBtu, or 0.0055 lb-VOC/MMBtu. [District Rules 2201, 4201, 4301, 4305, 4306, 4320, and 4801] Federally Enforceable Through Title V Permit
16. Duration of start-up or shutdown shall not exceed two hours each per occurrence. During start-up or shutdown, the emissions control system shall be in operation, and emissions shall be minimized insofar as technologically possible. The operator shall maintain daily records of the duration of start-up and shutdown periods. [District Rules 4305, 4306, and 4320] Federally Enforceable Through Title V Permit
17. Start-up is defined as the period of time during which a unit is brought from a shutdown status to its operating temperature and pressure, including the time required by the unit's emission control system to reach full operation. Shutdown is defined as the period of time during which a unit is taken from an operational to a non-operational status by allowing it to cool down from its operating temperature to ambient temperature as the fuel supply to the unit is completely turned off. [District Rules 4305, 4306, and 4320] Federally Enforceable Through Title V Permit

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CONDITIONS CONTINUE ON NEXT PAGE

18. Source testing to measure natural gas-combustion NO_x and CO emissions from this unit shall be conducted within 60 days of initial startup and at least once every twelve (12) months thereafter. After demonstrating compliance on two (2) consecutive annual source tests, the unit shall be tested not less than once every thirty-six (36) months. If the result of the 36-month source test demonstrates that the unit does not meet the applicable emission limits, the source testing frequency shall revert to at least once every twelve (12) months. [District Rules 2201, 4305, 4306, and 4320] Federally Enforceable Through Title V Permit
19. Permittee shall determine sulfur content of combusted gas annually or shall demonstrate that the combusted gas is provided from a PUC or FERC regulated source. [District Rules 1081 and 4320] Federally Enforceable Through Title V Permit
20. The source test plan shall identify which basis (ppmv or lb/MMBtu) will be used to demonstrate compliance. [District Rules 4305, 4306, and 4320] Federally Enforceable Through Title V Permit
21. Source testing shall be conducted using the methods and procedures approved by the District. The District must be notified at least 30 days prior to any compliance source test, and a source test plan must be submitted for approval at least 15 days prior to testing. [District Rule 1081] Federally Enforceable Through Title V Permit
22. The results of each source test shall be submitted to the District within 60 days thereafter. [District Rule 1081] Federally Enforceable Through Title V Permit
23. NO_x emissions for source test purposes shall be determined using EPA Method 7E or ARB Method 100 on a ppmv basis, or EPA Method 19 on a heat input basis. [District Rules 4305, 4306, and 4320] Federally Enforceable Through Title V Permit
24. CO emissions for source test purposes shall be determined using EPA Method 10 or ARB Method 100. [District Rules 4305, 4306, and 4320] Federally Enforceable Through Title V Permit
25. Stack gas oxygen (O₂) shall be determined using EPA Method 3 or 3A or ARB Method 100. [District Rules 4305, 4306, and 4320] Federally Enforceable Through Title V Permit
26. Fuel sulfur content shall be determined using EPA Method 11 or Method 15. [District Rule 4320] Federally Enforceable Through Title V Permit
27. All emissions measurements shall be made with the unit operating either at conditions representative of normal operations or conditions specified in the Permit to Operate. No determination of compliance shall be established within two hours after a continuous period in which fuel flow to the unit is shut off for 30 minutes or longer, or within 30 minutes after a re-ignition as defined in Section 3.0 of District Rule 4306. [District Rules 4305, 4306, and 4320] Federally Enforceable Through Title V Permit
28. For emissions source testing, the arithmetic average of three 30-consecutive-minute test runs shall apply. If two of three runs are above an applicable limit the test cannot be used to demonstrate compliance with an applicable limit. [District Rules 4305, 4306, and 4320] Federally Enforceable Through Title V Permit
29. Permittee shall determine sulfur content of combusted gas weekly for eight consecutive weeks. After demonstrating compliance for eight consecutive weeks testing may be conducted on a quarterly basis. Weekly sulfur testing shall resume if quarterly testing does not indicate compliance. Weekly gas analysis shall be performed using Draeger tubes and quarterly analysis using ASTM method D3246 or double GC for H₂S and mercaptans. First of the weekly gas analyses shall be done using laboratory analysis. [District Rules 1081 and 2201] Federally Enforceable Through Title V Permit
30. Compliance with fuel sulfur limit(s) can be demonstrated either by monitoring sulfur content at location(s) after all fuel sources are combined prior to incineration, or by monitoring the sulfur content and volume of each fuel source and performing mass balance calculations. Records of monitoring locations, detected sulfur concentrations, and mass balance calculations, if necessary, shall be maintained and kept onsite and made readily available for District inspection upon request. [District Rules 1081 and 2201] Federally Enforceable Through Title V Permit
31. The permittee shall monitor and record the stack concentration of NO_x, CO, and O₂ at least once every month (in which a source test is not performed) using a portable emission monitor that meets District specifications. Monitoring shall not be required if the unit is not in operation, i.e. the unit need not be started solely to perform monitoring. Monitoring shall be performed within 5 days of restarting the unit unless monitoring has been performed within the last month. [District Rules 4305, 4306, and 4320] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

32. If either the NO_x or CO concentrations corrected to 3% O₂, as measured by the portable analyzer, exceed the allowable emissions concentration, the permittee shall return the emissions to within the acceptable range as soon as possible, but no longer than 1 hour of operation after detection. If the portable analyzer readings continue to exceed the allowable emissions concentration after 1 hour of operation after detection, the permittee shall notify the District within the following 1 hour and conduct a certified source test within 60 days of the first exceedance. In lieu of conducting a source test, the permittee may stipulate a violation has occurred, subject to enforcement action. The permittee must then correct the violation, show compliance has been re-established, and resume monitoring procedures. If the deviations are the result of a qualifying breakdown condition pursuant to Rule 1100, the permittee may fully comply with Rule 1100 in lieu of the performing the notification and testing required by this condition. [District Rules 4305, 4306, and 4320] Federally Enforceable Through Title V Permit
33. All alternate monitoring parameter emission readings shall be taken with the unit operating either at conditions representative of normal operations or conditions specified in the Permit to Operate. The analyzer shall be calibrated, maintained, and operated in accordance with the manufacturer's specifications and recommendations or a protocol approved by the APCO. Emission readings taken shall be averaged over a 15 consecutive-minute period by either taking a cumulative 15 consecutive-minute sample reading or by taking at least five (5) readings, evenly spaced out over the 15 consecutive-minute period. [District Rules 4305, 4306, and 4320] Federally Enforceable Through Title V Permit
34. The permittee shall maintain records of: (1) the date and time of NO_x, CO, and O₂ measurements, (2) the O₂ concentration in percent and the measured NO_x and CO concentrations corrected to 3% O₂, (3) make and model of exhaust gas analyzer, (4) exhaust gas analyzer calibration records, and (5) a description of any corrective action taken to maintain the emissions within the acceptable range. [District Rules 4305, 4306, and 4320] Federally Enforceable Through Title V Permit
35. All records shall be maintained and retained on-site for a minimum of five (5) years, and shall be made available for District inspection upon request. [District Rules 1070, 4305, 4306, 4320, and 40 CFR 60.48c(i)] Federally Enforceable Through Title V Permit

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San Joaquin Valley
Air Pollution Control District

AUTHORITY TO CONSTRUCT

DRAFT
ISSUANCE DATE: DRAFT

PERMIT NO: S-1246-366-0

LEGAL OWNER OR OPERATOR: BERRY PETROLEUM COMPANY
MAILING ADDRESS: 5201 TRUXTUN AVENUE SUITE 100
ATTN: EH&S MANAGER
BAKERSFIELD, CA 93309-0422

LOCATION: HEAVY OIL WESTERN STATIONARY SOURCE
KERN COUNTY, CA

EQUIPMENT DESCRIPTION:

85 MMBTU/HR NATURAL/ETHANE-RICH NATURAL/TEOR/TVR GAS-FIRED STEAM GENERATOR (MJN-439) WITH A NORTH AMERICAN MAGNA FLAME LE ULTRA LOW NOX BURNER, FLUE GAS RECIRCULATION (FGR) AND AN O2 CONTROLLER

CONDITIONS

1. {1830} This Authority to Construct serves as a written certificate of conformity with the procedural requirements of 40 CFR 70.7 and 70.8 and with the compliance requirements of 40 CFR 70.6(c). [District Rule 2201] Federally Enforceable Through Title V Permit
2. {1831} Prior to operating with modifications authorized by this Authority to Construct, the facility shall submit an application to modify the Title V permit with an administrative amendment in accordance with District Rule 2520 Section 5.3.4. [District Rule 2520, 5.3.4] Federally Enforceable Through Title V Permit
3. Prior to startup of the equipment authorized by this Authority to Construct, Permit to Operate S-1246-215 shall be surrendered to the District and the associated equipment shall be removed or rendered inoperable. [District Rule 2201] Federally Enforceable Through Title V Permit
4. Prior to operating equipment under this Authority to Construct, permittee shall surrender NOX emission reduction credits for the following quantity of emissions: 1st quarter - 2,234 lb, 2nd quarter - 2,234 lb, 3rd quarter - 2,234 lb, and fourth quarter - 2,234 lb. These amounts include the applicable offset ratio specified in Rule 2201 Section 4.8 (as amended 4/21/11) for the ERC specified below. [District Rule 2201] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (661) 392-5500 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT. This is NOT a PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, this Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

Seyed Sadredin, Executive Director, APCO

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DAVID WARNER, Director of Permit Services
S-1246-366-0 : May 21 2013 2:46PM - DAVIDS08 : Joint Inspection NOT Required

5. Prior to operating equipment under this Authority to Construct, permittee shall surrender SOX emission reduction credits for the following quantity of emissions: 1st quarter -2,932 lb, 2nd quarter - 2,932 lb, 3rd quarter - 2,392 lb, and fourth quarter - 2,392 lb. These amounts include the applicable offset ratio specified in Rule 2201 Section 4.8 (as amended 4/21/11) for the ERC specified below. [District Rule 2201] Federally Enforceable Through Title V Permit
6. ERC Certificate Numbers S-3820-2, and S-3917-5 (or certificates split from these certificates) shall be used to supply the required offsets, unless a revised offsetting proposal is received and approved by the District, upon which this Authority to Construct shall be reissued, administratively specifying the new offsetting proposal. Original public noticing requirements, if any, shall be duplicated prior to reissuance of this Authority to Construct. [District Rule 2201] Federally Enforceable Through Title V Permit
7. No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20% opacity. [District Rule 4101] Federally Enforceable Through Title V Permit
8. All equipment shall be maintained in good operating condition and shall be operated in a manner to minimize emissions of air contaminants into the atmosphere. [District Rule 2201] Federally Enforceable Through Title V Permit
9. This unit shall be equipped with horizontal convection section with at least 235 square feet of bare tube surface area (or thermodynamically equivalent number of square feet of finned tube) per MMBtu/hr of heat input. [District Rule 2410] Federally Enforceable Through Title V Permit
10. This unit shall be equipped with variable frequency drive high efficiency electrical motors driving the blower and water pump. [District Rule 2410] Federally Enforceable Through Title V Permit
11. The unit shall only be fired on natural/TEOR/ethane rich gas with a maximum sulfur content of 1 gr S/100scf. [District Rules 2201, 4301, and 4320] Federally Enforceable Through Title V Permit
12. At least quarterly, the permittee shall monitor using the methods specified in this permit the higher heating value of each non-certified fuel supplied to this unit, or, alternatively, have the higher heating value certified by the fuel supplier. The records of higher heating value and quantity of fuel combusted shall be used to demonstrate that the rated heat input capacity of this unit, as averaged over a calendar quarter, is not exceeded. [District Rules 2201] Federally Enforceable Through Title V Permit
13. The higher heating value of each non-certified fuel shall be certified by a third party fuel supplier or determined by ASTM D1826 or D1945 in conjunction with ASTM D 3588. [District Rules 2201 and 4320] Federally Enforceable Through Title V Permit
14. This unit shall be fired on natural gas or ethane-rich natural gas with a sulfur content that does not exceed 1 gr of sulfur compounds (as S) per 100 scf. [District Rules 2201 and 4320] Federally Enforceable Through Title V Permit
15. Except for periods of startup and shutdown, emissions from the natural gas-fired unit shall not exceed any of the following limits: 7 ppmvd NO_x @ 3% O₂ or 0.008 lb-NO_x/MMBtu, 0.005 lb-PM₁₀/MMBtu, 35 ppmvd CO @ 3% O₂ or 0.026 lb-CO/MMBtu, or 0.0055 lb-VOC/MMBtu. [District Rules 2201, 4201, 4301, 4305, 4306, 4320, and 4801] Federally Enforceable Through Title V Permit
16. Duration of start-up or shutdown shall not exceed two hours each per occurrence. During start-up or shutdown, the emissions control system shall be in operation, and emissions shall be minimized insofar as technologically possible. The operator shall maintain daily records of the duration of start-up and shutdown periods. [District Rules 4305, 4306, and 4320] Federally Enforceable Through Title V Permit
17. Start-up is defined as the period of time during which a unit is brought from a shutdown status to its operating temperature and pressure, including the time required by the unit's emission control system to reach full operation. Shutdown is defined as the period of time during which a unit is taken from an operational to a non-operational status by allowing it to cool down from its operating temperature to ambient temperature as the fuel supply to the unit is completely turned off. [District Rules 4305, 4306, and 4320] Federally Enforceable Through Title V Permit

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CONDITIONS CONTINUE ON NEXT PAGE

18. Source testing to measure natural gas-combustion NOx and CO emissions from this unit shall be conducted within 60 days of initial startup and at least once every twelve (12) months thereafter. After demonstrating compliance on two (2) consecutive annual source tests, the unit shall be tested not less than once every thirty-six (36) months. If the result of the 36-month source test demonstrates that the unit does not meet the applicable emission limits, the source testing frequency shall revert to at least once every twelve (12) months. [District Rules 2201, 4305, 4306, and 4320] Federally Enforceable Through Title V Permit
19. Permittee shall determine sulfur content of combusted gas annually or shall demonstrate that the combusted gas is provided from a PUC or FERC regulated source. [District Rules 1081 and 4320] Federally Enforceable Through Title V Permit
20. The source test plan shall identify which basis (ppmv or lb/MMBtu) will be used to demonstrate compliance. [District Rules 4305, 4306, and 4320] Federally Enforceable Through Title V Permit
21. Source testing shall be conducted using the methods and procedures approved by the District. The District must be notified at least 30 days prior to any compliance source test, and a source test plan must be submitted for approval at least 15 days prior to testing. [District Rule 1081] Federally Enforceable Through Title V Permit
22. The results of each source test shall be submitted to the District within 60 days thereafter. [District Rule 1081] Federally Enforceable Through Title V Permit
23. NOx emissions for source test purposes shall be determined using EPA Method 7E or ARB Method 100 on a ppmv basis, or EPA Method 19 on a heat input basis. [District Rules 4305, 4306, and 4320] Federally Enforceable Through Title V Permit
24. CO emissions for source test purposes shall be determined using EPA Method 10 or ARB Method 100. [District Rules 4305, 4306, and 4320] Federally Enforceable Through Title V Permit
25. Stack gas oxygen (O2) shall be determined using EPA Method 3 or 3A or ARB Method 100. [District Rules 4305, 4306, and 4320] Federally Enforceable Through Title V Permit
26. Fuel sulfur content shall be determined using EPA Method 11 or Method 15. [District Rule 4320] Federally Enforceable Through Title V Permit
27. All emissions measurements shall be made with the unit operating either at conditions representative of normal operations or conditions specified in the Permit to Operate. No determination of compliance shall be established within two hours after a continuous period in which fuel flow to the unit is shut off for 30 minutes or longer, or within 30 minutes after a re-ignition as defined in Section 3.0 of District Rule 4306. [District Rules 4305, 4306, and 4320] Federally Enforceable Through Title V Permit
28. For emissions source testing, the arithmetic average of three 30-consecutive-minute test runs shall apply. If two of three runs are above an applicable limit the test cannot be used to demonstrate compliance with an applicable limit. [District Rules 4305, 4306, and 4320] Federally Enforceable Through Title V Permit
29. Permittee shall determine sulfur content of combusted gas weekly for eight consecutive weeks. After demonstrating compliance for eight consecutive weeks testing may be conducted on a quarterly basis. Weekly sulfur testing shall resume if quarterly testing does not indicate compliance. Weekly gas analysis shall be performed using Draeger tubes and quarterly analysis using ASTM method D3246 or double GC for H2S and mercaptans. First of the weekly gas analyses shall be done using laboratory analysis. [District Rules 1081 and 2201] Federally Enforceable Through Title V Permit
30. Compliance with fuel sulfur limit(s) can be demonstrated either by monitoring sulfur content at location(s) after all fuel sources are combined prior to incineration, or by monitoring the sulfur content and volume of each fuel source and performing mass balance calculations. Records of monitoring locations, detected sulfur concentrations, and mass balance calculations, if necessary, shall be maintained and kept onsite and made readily available for District inspection upon request. [District Rules 1081 and 2201] Federally Enforceable Through Title V Permit
31. The permittee shall monitor and record the stack concentration of NOx, CO, and O2 at least once every month (in which a source test is not performed) using a portable emission monitor that meets District specifications. Monitoring shall not be required if the unit is not in operation, i.e. the unit need not be started solely to perform monitoring. Monitoring shall be performed within 5 days of restarting the unit unless monitoring has been performed within the last month. [District Rules 4305, 4306, and 4320] Federally Enforceable Through Title V Permit

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CONDITIONS CONTINUE ON NEXT PAGE

32. If either the NO_x or CO concentrations corrected to 3% O₂, as measured by the portable analyzer, exceed the allowable emissions concentration, the permittee shall return the emissions to within the acceptable range as soon as possible, but no longer than 1 hour of operation after detection. If the portable analyzer readings continue to exceed the allowable emissions concentration after 1 hour of operation after detection, the permittee shall notify the District within the following 1 hour and conduct a certified source test within 60 days of the first exceedance. In lieu of conducting a source test, the permittee may stipulate a violation has occurred, subject to enforcement action. The permittee must then correct the violation, show compliance has been re-established, and resume monitoring procedures. If the deviations are the result of a qualifying breakdown condition pursuant to Rule 1100, the permittee may fully comply with Rule 1100 in lieu of the performing the notification and testing required by this condition. [District Rules 4305, 4306, and 4320] Federally Enforceable Through Title V Permit
33. All alternate monitoring parameter emission readings shall be taken with the unit operating either at conditions representative of normal operations or conditions specified in the Permit to Operate. The analyzer shall be calibrated, maintained, and operated in accordance with the manufacturer's specifications and recommendations or a protocol approved by the APCO. Emission readings taken shall be averaged over a 15 consecutive-minute period by either taking a cumulative 15 consecutive-minute sample reading or by taking at least five (5) readings, evenly spaced out over the 15 consecutive-minute period. [District Rules 4305, 4306, and 4320] Federally Enforceable Through Title V Permit
34. The permittee shall maintain records of: (1) the date and time of NO_x, CO, and O₂ measurements, (2) the O₂ concentration in percent and the measured NO_x and CO concentrations corrected to 3% O₂, (3) make and model of exhaust gas analyzer, (4) exhaust gas analyzer calibration records, and (5) a description of any corrective action taken to maintain the emissions within the acceptable range. [District Rules 4305, 4306, and 4320] Federally Enforceable Through Title V Permit
35. All records shall be maintained and retained on-site for a minimum of five (5) years, and shall be made available for District inspection upon request. [District Rules 1070, 4305, 4306, 4320, and 40 CFR 60.48c(i)] Federally Enforceable Through Title V Permit

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San Joaquin Valley
Air Pollution Control District

AUTHORITY TO CONSTRUCT

ISSUANCE DATE: DRAFT
DRAFT

PERMIT NO: S-1246-367-0

LEGAL OWNER OR OPERATOR: BERRY PETROLEUM COMPANY
MAILING ADDRESS: 5201 TRUXTUN AVENUE SUITE 100
ATTN: EH&S MANAGER
BAKERSFIELD, CA 93309-0422

LOCATION: HEAVY OIL WESTERN STATIONARY SOURCE
KERN COUNTY, CA

EQUIPMENT DESCRIPTION:

85 MMBTU/HR NATURAL/ETHANE-RICH NATURAL/TEOR/TVR GAS-FIRED STEAM GENERATOR (MJN-440) WITH A NORTH AMERICAN MAGNA FLAME LE ULTRA LOW NOX BURNER, FLUE GAS RECIRCULATION (FGR) AND AN O2 CONTROLLER

CONDITIONS

1. {1830} This Authority to Construct serves as a written certificate of conformity with the procedural requirements of 40 CFR 70.7 and 70.8 and with the compliance requirements of 40 CFR 70.6(c). [District Rule 2201] Federally Enforceable Through Title V Permit
2. {1831} Prior to operating with modifications authorized by this Authority to Construct, the facility shall submit an application to modify the Title V permit with an administrative amendment in accordance with District Rule 2520 Section 5.3.4. [District Rule 2520, 5.3.4] Federally Enforceable Through Title V Permit
3. Prior to startup of the equipment authorized by this Authority to Construct, Permit to Operate S-1246-215 shall be surrendered to the District and the associated equipment shall be removed or rendered inoperable. [District Rule 2201] Federally Enforceable Through Title V Permit
4. Prior to operating equipment under this Authority to Construct, permittee shall surrender NOX emission reduction credits for the following quantity of emissions: 1st quarter - 2,234 lb, 2nd quarter - 2,234 lb, 3rd quarter - 2,234 lb, and fourth quarter - 2,234 lb. These amounts include the applicable offset ratio specified in Rule 2201 Section 4.8 (as amended 4/21/11) for the ERC specified below. [District Rule 2201] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (661) 392-5500 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT. This is NOT a PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, this Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

Seyed Sadredin, Executive Director APCO

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DAVID WARNER, Director of Permit Services

S-1246-367-0: May 21 2013 2:40PM - DAVIDSOB : Joint Inspection NOT Required

5. Prior to operating equipment under this Authority to Construct, permittee shall surrender SOX emission reduction credits for the following quantity of emissions: 1st quarter -2,932 lb, 2nd quarter - 2,932 lb, 3rd quarter - 2,392 lb, and fourth quarter - 2,392 lb. These amounts include the applicable offset ratio specified in Rule 2201 Section 4.8 (as amended 4/21/11) for the ERC specified below. [District Rule 2201] Federally Enforceable Through Title V Permit
6. ERC Certificate Numbers S-3820-2, and S-3917-5 (or certificates split from these certificates) shall be used to supply the required offsets, unless a revised offsetting proposal is received and approved by the District, upon which this Authority to Construct shall be reissued, administratively specifying the new offsetting proposal. Original public noticing requirements, if any, shall be duplicated prior to reissuance of this Authority to Construct. [District Rule 2201] Federally Enforceable Through Title V Permit
7. No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20% opacity. [District Rule 4101] Federally Enforceable Through Title V Permit
8. All equipment shall be maintained in good operating condition and shall be operated in a manner to minimize emissions of air contaminants into the atmosphere. [District Rule 2201] Federally Enforceable Through Title V Permit
9. This unit shall be equipped with horizontal convection section with at least 235 square feet of bare tube surface area (or thermodynamically equivalent number of square feet of finned tube) per MMBtu/hr of heat input. [District Rule 2410] Federally Enforceable Through Title V Permit
10. This unit shall be equipped with variable frequency drive high efficiency electrical motors driving the blower and water pump. [District Rule 2410] Federally Enforceable Through Title V Permit
11. The unit shall only be fired on natural/TEOR/ethane rich gas with a maximum sulfur content of 1 gr S/100scf. [District Rules 2201, 4301, and 4320] Federally Enforceable Through Title V Permit
12. At least quarterly, the permittee shall monitor using the methods specified in this permit the higher heating value of each non-certified fuel supplied to this unit, or, alternatively, have the higher heating value certified by the fuel supplier. The records of higher heating value and quantity of fuel combusted shall be used to demonstrate that the rated heat input capacity of this unit, as averaged over a calendar quarter, is not exceeded. [District Rules 2201] Federally Enforceable Through Title V Permit
13. The higher heating value of each non-certified fuel shall be certified by a third party fuel supplier or determined by ASTM D1826 or D1945 in conjunction with ASTM D 3588. [District Rules 2201 and 4320] Federally Enforceable Through Title V Permit
14. This unit shall be fired on natural gas or ethane-rich natural gas with a sulfur content that does not exceed 1 gr of sulfur compounds (as S) per 100 scf. [District Rules 2201 and 4320] Federally Enforceable Through Title V Permit
15. Except for periods of startup and shutdown, emissions from the natural gas-fired unit shall not exceed any of the following limits: 7 ppmvd NO_x @ 3% O₂ or 0.008 lb-NO_x/MMBtu, 0.005 lb-PM₁₀/MMBtu, 35 ppmvd CO @ 3% O₂ or 0.026 lb-CO/MMBtu, or 0.0055 lb-VOC/MMBtu. [District Rules 2201, 4201, 4301, 4305, 4306, 4320, and 4801] Federally Enforceable Through Title V Permit
16. Duration of start-up or shutdown shall not exceed two hours each per occurrence. During start-up or shutdown, the emissions control system shall be in operation, and emissions shall be minimized insofar as technologically possible. The operator shall maintain daily records of the duration of start-up and shutdown periods. [District Rules 4305, 4306, and 4320] Federally Enforceable Through Title V Permit
17. Start-up is defined as the period of time during which a unit is brought from a shutdown status to its operating temperature and pressure, including the time required by the unit's emission control system to reach full operation. Shutdown is defined as the period of time during which a unit is taken from an operational to a non-operational status by allowing it to cool down from its operating temperature to ambient temperature as the fuel supply to the unit is completely turned off. [District Rules 4305, 4306, and 4320] Federally Enforceable Through Title V Permit

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CONDITIONS CONTINUE ON NEXT PAGE

18. Source testing to measure natural gas-combustion NO_x and CO emissions from this unit shall be conducted within 60 days of initial startup and at least once every twelve (12) months thereafter. After demonstrating compliance on two (2) consecutive annual source tests, the unit shall be tested not less than once every thirty-six (36) months. If the result of the 36-month source test demonstrates that the unit does not meet the applicable emission limits, the source testing frequency shall revert to at least once every twelve (12) months. [District Rules 2201, 4305, 4306, and 4320] Federally Enforceable Through Title V Permit
19. Permittee shall determine sulfur content of combusted gas annually or shall demonstrate that the combusted gas is provided from a PUC or FERC regulated source. [District Rules 1081 and 4320] Federally Enforceable Through Title V Permit
20. The source test plan shall identify which basis (ppmv or lb/MMBtu) will be used to demonstrate compliance. [District Rules 4305, 4306, and 4320] Federally Enforceable Through Title V Permit
21. Source testing shall be conducted using the methods and procedures approved by the District. The District must be notified at least 30 days prior to any compliance source test, and a source test plan must be submitted for approval at least 15 days prior to testing. [District Rule 1081] Federally Enforceable Through Title V Permit
22. The results of each source test shall be submitted to the District within 60 days thereafter. [District Rule 1081] Federally Enforceable Through Title V Permit
23. NO_x emissions for source test purposes shall be determined using EPA Method 7E or ARB Method 100 on a ppmv basis, or EPA Method 19 on a heat input basis. [District Rules 4305, 4306, and 4320] Federally Enforceable Through Title V Permit
24. CO emissions for source test purposes shall be determined using EPA Method 10 or ARB Method 100. [District Rules 4305, 4306, and 4320] Federally Enforceable Through Title V Permit
25. Stack gas oxygen (O₂) shall be determined using EPA Method 3 or 3A or ARB Method 100. [District Rules 4305, 4306, and 4320] Federally Enforceable Through Title V Permit
26. Fuel sulfur content shall be determined using EPA Method 11 or Method 15. [District Rule 4320] Federally Enforceable Through Title V Permit
27. All emissions measurements shall be made with the unit operating either at conditions representative of normal operations or conditions specified in the Permit to Operate. No determination of compliance shall be established within two hours after a continuous period in which fuel flow to the unit is shut off for 30 minutes or longer, or within 30 minutes after a re-ignition as defined in Section 3.0 of District Rule 4306. [District Rules 4305, 4306, and 4320] Federally Enforceable Through Title V Permit
28. For emissions source testing, the arithmetic average of three 30-consecutive-minute test runs shall apply. If two of three runs are above an applicable limit the test cannot be used to demonstrate compliance with an applicable limit. [District Rules 4305, 4306, and 4320] Federally Enforceable Through Title V Permit
29. Permittee shall determine sulfur content of combusted gas weekly for eight consecutive weeks. After demonstrating compliance for eight consecutive weeks testing may be conducted on a quarterly basis. Weekly sulfur testing shall resume if quarterly testing does not indicate compliance. Weekly gas analysis shall be performed using Draeger tubes and quarterly analysis using ASTM method D3246 or double GC for H₂S and mercaptans. First of the weekly gas analyses shall be done using laboratory analysis. [District Rules 1081 and 2201] Federally Enforceable Through Title V Permit
30. Compliance with fuel sulfur limit(s) can be demonstrated either by monitoring sulfur content at location(s) after all fuel sources are combined prior to incineration, or by monitoring the sulfur content and volume of each fuel source and performing mass balance calculations. Records of monitoring locations, detected sulfur concentrations, and mass balance calculations, if necessary, shall be maintained and kept onsite and made readily available for District inspection upon request. [District Rules 1081 and 2201] Federally Enforceable Through Title V Permit
31. The permittee shall monitor and record the stack concentration of NO_x, CO, and O₂ at least once every month (in which a source test is not performed) using a portable emission monitor that meets District specifications. Monitoring shall not be required if the unit is not in operation, i.e. the unit need not be started solely to perform monitoring. Monitoring shall be performed within 5 days of restarting the unit unless monitoring has been performed within the last month. [District Rules 4305, 4306, and 4320] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

32. If either the NO_x or CO concentrations corrected to 3% O₂, as measured by the portable analyzer, exceed the allowable emissions concentration, the permittee shall return the emissions to within the acceptable range as soon as possible, but no longer than 1 hour of operation after detection. If the portable analyzer readings continue to exceed the allowable emissions concentration after 1 hour of operation after detection, the permittee shall notify the District within the following 1 hour and conduct a certified source test within 60 days of the first exceedance. In lieu of conducting a source test, the permittee may stipulate a violation has occurred, subject to enforcement action. The permittee must then correct the violation, show compliance has been re-established, and resume monitoring procedures. If the deviations are the result of a qualifying breakdown condition pursuant to Rule 1100, the permittee may fully comply with Rule 1100 in lieu of the performing the notification and testing required by this condition. [District Rules 4305, 4306, and 4320] Federally Enforceable Through Title V Permit
33. All alternate monitoring parameter emission readings shall be taken with the unit operating either at conditions representative of normal operations or conditions specified in the Permit to Operate. The analyzer shall be calibrated, maintained, and operated in accordance with the manufacturer's specifications and recommendations or a protocol approved by the APCO. Emission readings taken shall be averaged over a 15 consecutive-minute period by either taking a cumulative 15 consecutive-minute sample reading or by taking at least five (5) readings, evenly spaced out over the 15 consecutive-minute period. [District Rules 4305, 4306, and 4320] Federally Enforceable Through Title V Permit
34. The permittee shall maintain records of: (1) the date and time of NO_x, CO, and O₂ measurements, (2) the O₂ concentration in percent and the measured NO_x and CO concentrations corrected to 3% O₂, (3) make and model of exhaust gas analyzer, (4) exhaust gas analyzer calibration records, and (5) a description of any corrective action taken to maintain the emissions within the acceptable range. [District Rules 4305, 4306, and 4320] Federally Enforceable Through Title V Permit
35. All records shall be maintained and retained on-site for a minimum of five (5) years, and shall be made available for District inspection upon request. [District Rules 1070, 4305, 4306, 4320, and 40 CFR 60.48c(i)] Federally Enforceable Through Title V Permit

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San Joaquin Valley
Air Pollution Control District

AUTHORITY TO CONSTRUCT

ISSUANCE DATE: DRAFT
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PERMIT NO: S-1246-368-0

LEGAL OWNER OR OPERATOR: BERRY PETROLEUM COMPANY
MAILING ADDRESS: 5201 TRUXTUN AVENUE SUITE 100
ATTN: EH&S MANAGER
BAKERSFIELD, CA 93309-0422

LOCATION: HEAVY OIL WESTERN STATIONARY SOURCE
KERN COUNTY, CA

EQUIPMENT DESCRIPTION:

85 MMBTU/HR NATURAL/ETHANE-RICH NATURAL/TEOR/TVR GAS-FIRED STEAM GENERATOR (MJN-441) WITH A NORTH AMERICAN MAGNA FLAME LE ULTRA LOW NOX BURNER, FLUE GAS RECIRCULATION (FGR) AND AN O2 CONTROLLER

CONDITIONS

1. {1830} This Authority to Construct serves as a written certificate of conformity with the procedural requirements of 40 CFR 70.7 and 70.8 and with the compliance requirements of 40 CFR 70.6(c). [District Rule 2201] Federally Enforceable Through Title V Permit
2. {1831} Prior to operating with modifications authorized by this Authority to Construct, the facility shall submit an application to modify the Title V permit with an administrative amendment in accordance with District Rule 2520 Section 5.3.4. [District Rule 2520, 5.3.4] Federally Enforceable Through Title V Permit
3. Prior to startup of the equipment authorized by this Authority to Construct, Permit to Operate S-1246-215 shall be surrendered to the District and the associated equipment shall be removed or rendered inoperable. [District Rule 2201] Federally Enforceable Through Title V Permit
4. Prior to operating equipment under this Authority to Construct, permittee shall surrender NOX emission reduction credits for the following quantity of emissions: 1st quarter - 2,234 lb, 2nd quarter - 2,234 lb, 3rd quarter - 2,234 lb, and fourth quarter - 2,234 lb. These amounts include the applicable offset ratio specified in Rule 2201 Section 4.8 (as amended 4/21/11) for the ERC specified below. [District Rule 2201] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

YOU **MUST** NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (661) 392-5500 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT. This is NOT a PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, this Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

Seyed Sadredin, Executive Director APCO

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DAVID WARNER, Director of Permit Services

S-1246-368-0 : May 21 2013 2:40PM - DAVIDSON : Joint Inspection NOT Required

5. Prior to operating equipment under this Authority to Construct, permittee shall surrender SOX emission reduction credits for the following quantity of emissions: 1st quarter -2,932 lb, 2nd quarter - 2,932 lb, 3rd quarter - 2,392 lb, and fourth quarter - 2,392 lb. These amounts include the applicable offset ratio specified in Rule 2201 Section 4.8 (as amended 4/21/11) for the ERC specified below. [District Rule 2201] Federally Enforceable Through Title V Permit
6. ERC Certificate Numbers S-3820-2, and S-3917-5 (or certificates split from these certificates) shall be used to supply the required offsets, unless a revised offsetting proposal is received and approved by the District, upon which this Authority to Construct shall be reissued, administratively specifying the new offsetting proposal. Original public noticing requirements, if any, shall be duplicated prior to reissuance of this Authority to Construct. [District Rule 2201] Federally Enforceable Through Title V Permit
7. No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20% opacity. [District Rule 4101] Federally Enforceable Through Title V Permit
8. All equipment shall be maintained in good operating condition and shall be operated in a manner to minimize emissions of air contaminants into the atmosphere. [District Rule 2201] Federally Enforceable Through Title V Permit
9. This unit shall be equipped with horizontal convection section with at least 235 square feet of bare tube surface area (or thermodynamically equivalent number of square feet of finned tube) per MMBtu/hr of heat input. [District Rule 2410] Federally Enforceable Through Title V Permit
10. This unit shall be equipped with variable frequency drive high efficiency electrical motors driving the blower and water pump. [District Rule 2410] Federally Enforceable Through Title V Permit
11. The unit shall only be fired on natural/TEOR/ethane rich gas with a maximum sulfur content of 1 gr S/100scf. [District Rules 2201, 4301, and 4320] Federally Enforceable Through Title V Permit
12. At least quarterly, the permittee shall monitor using the methods specified in this permit the higher heating value of each non-certified fuel supplied to this unit, or, alternatively, have the higher heating value certified by the fuel supplier. The records of higher heating value and quantity of fuel combusted shall be used to demonstrate that the rated heat input capacity of this unit, as averaged over a calendar quarter, is not exceeded. [District Rules 2201] Federally Enforceable Through Title V Permit
13. The higher heating value of each non-certified fuel shall be certified by a third party fuel supplier or determined by ASTM D1826 or D1945 in conjunction with ASTM D 3588. [District Rules 2201 and 4320] Federally Enforceable Through Title V Permit
14. This unit shall be fired on natural gas or ethane-rich natural gas with a sulfur content that does not exceed 1 gr of sulfur compounds (as S) per 100 scf. [District Rules 2201 and 4320] Federally Enforceable Through Title V Permit
15. Except for periods of startup and shutdown, emissions from the natural gas-fired unit shall not exceed any of the following limits: 7 ppmvd NO_x @ 3% O₂ or 0.008 lb-NO_x/MMBtu, 0.005 lb-PM₁₀/MMBtu, 35 ppmvd CO @ 3% O₂ or 0.026 lb-CO/MMBtu, or 0.0055 lb-VOC/MMBtu. [District Rules 2201, 4201, 4301, 4305, 4306, 4320, and 4801] Federally Enforceable Through Title V Permit
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