PERMIT TO OPERATE 15001

And

PART 70 OPERATING PERMIT 15001

SIERRA RESOURCES - BARHAM RANCH STATIONARY SOURCE
BARHAM/BOYNE LEASE - BARHAM RANCH

LOS ALAMOS
SANTA BARBARA COUNTY, CALIFORNIA

OWNER/OPERATOR

Purisma Hills LLC / Sierra Resources, Inc. (Sierra Resources)

Santa Barbara County
Air Pollution Control District

August 2018

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ABBREVIATIONS/ACRONYMS

AP-42	USEPA's *Compilation of Emission Factors*
API	American Petroleum Institute
ASTM	American Society for Testing Materials
BACT	Best Available Control Technology
BOEM	Bureau of Ocean Energy Management
bpd	barrels per day (1 barrel = 42 gallons)
CAM	compliance assurance monitoring
CEMS	continuous emissions monitoring
District	Santa Barbara County Air Pollution Control District
dscf	dry standard cubic foot
EU	emission unit
°F	degree Fahrenheit
gal	gallon
gr	grain
HAP	hazardous air pollutant (as defined by CAAA, Section 112(b))
H_2S	hydrogen sulfide
I&M	inspection & maintenance
k	kilo (thousand)
l	liter
lb	pound
lbs/day	pounds per day
lbs/hr	pounds per hour
LACT	Lease Automatic Custody Transfer
LPG	liquid petroleum gas
M	mega (million)
MACT	Maximum Achievable Control Technology
MM	million
MW	molecular weight
NG	natural gas
NSPS	New Source Performance Standards
O_2	oxygen
OCS	outer continental shelf
ppm (vd or w)	parts per million (volume dry or weight)
psia	pounds per square inch absolute
psig	pounds per square inch gauge
PRD	pressure relief device
PTO	Permit to Operate
RACT	Reasonably Available Control Technology
ROC	reactive organic compounds, same as "VOC" as used in this permit
RVP	Reid vapor pressure
scf	standard cubic foot
scfd (or scfm)	standard cubic feet per day (or per minute)
SIP	State Implementation Plan
STP	standard temperature (60°F) and pressure (29.92 inches of mercury)
THC	Total hydrocarbons
tpy, TPY	tons per year
TVP	true vapor pressure
USEPA	United States Environmental Protection Agency
VE	visible emissions
VRS	vapor recovery system

1.0 Introduction

1.1 Purpose

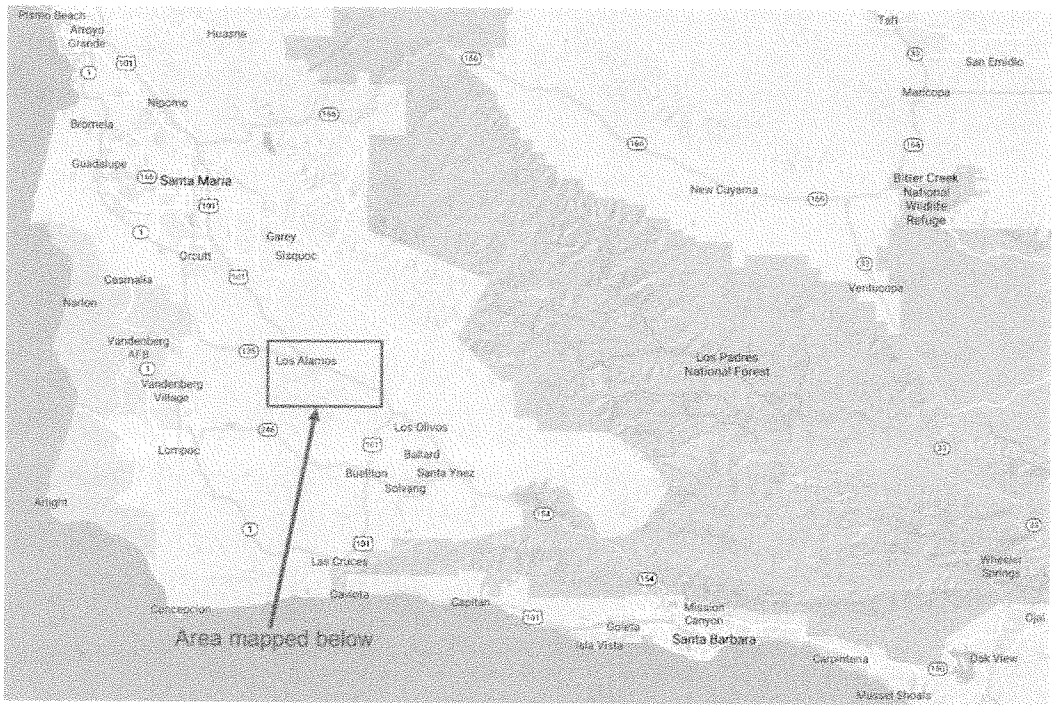
General: The Santa Barbara County Air Pollution Control District (District) is responsible for implementing all applicable federal, state and local air pollution requirements that affect any stationary source of air pollution in Santa Barbara County. The federal requirements include regulations listed in the Code of Federal Regulations: 40 CFR Parts 50, 51, 52, 55, 61, 63, 68, 70 and 82. The State regulations may be found in the California Health & Safety Code, Division 26, Section 39000 et seq. The applicable local regulations can be found in the District's Rules and Regulations. This is a combined permitting action that covers both the Federal Part 70 permit (*Part 70 Operating Permit 15001*) as well as the State Operating Permit (*Permit to Operate 15001*).

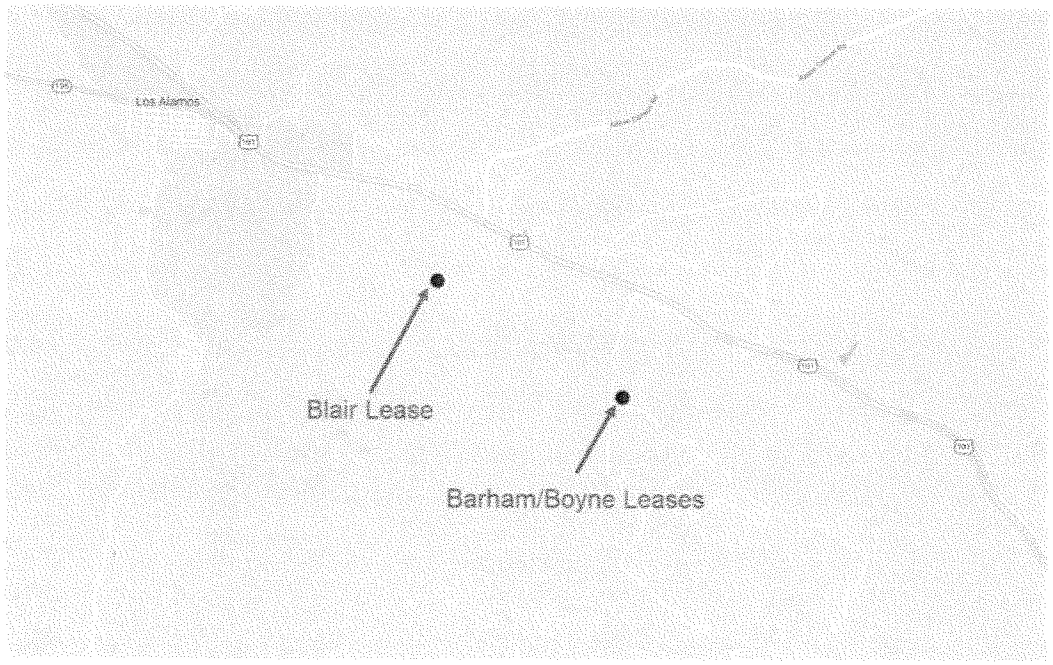
Part 70 Permitting: This the initial Part 70 permit for the Barham/Boyne Lease and is being issued in accordance with the requirements of the District's Part 70 operating permit program. The Barham/Boyne Lease is a part of the Sierra Resources Barham Ranch Stationary Source, which is a major source for ROC and CO emissions. Conditions listed in this permit are based on federal, state or local rules and requirements. Sections 9.A, 9.B and 9.C of this permit are enforceable by the District, the USEPA and the public since these sections are federally-enforceable under Part 70. Where any reference contained in Sections 9.A, 9.B or 9.C refers to any other part of this permit, that part of the permit referred to is federally-enforceable.

Pursuant to the stated aims of Title V of the CAAA of 1990 (i.e., the Part 70 operating permit program), this permit has been designed to meet two objectives. First, compliance with all conditions in this permit would ensure compliance with all federally-enforceable requirements for the facility. Next, the permit would be a comprehensive document to be used as a reference by the permittee, the regulatory agencies and the public to assess compliance.

Greenhouse Gases - Rule 810. This reevaluation incorporates greenhouse gas emission calculations for the stationary source. These emissions establish baseline conditions under Rule 810, *Federal Prevention of Significant Deterioration.*

Figure 1.1 - Location Map for the Barham/Boyne Lease





1.2 *Stationary Source / Facility Overview*

1.2.1 General Overview: Purisima Hills LLC is the sole owner and Sierra Resources, Inc. is the operator of the Barham Ranch Stationary Source located in the city of Los Alamos, an unincorporated area of Santa Barbara County at is 9500 US Highway 101. For District regulatory purposes, it is in the Northern Zone of Santa Barbara County[1]. Figure 1.1 shows the location of the facility. The Barham Ranch Stationary Source became a Pt70 source as a result of a District determination in February 2017 that the Blair and the Barham/Boyne Leases comprised a single stationary source. The Barham Ranch Stationary Source (SSID 2638) was constructed in the early 1990s and is comprised of the following facilities:

- Blair Lease (FID 2637)
- Barham/Boyne Leases (FID 3777)
- IC Engines (FID 11609)

The Barham/Boyne Lease consists of the following oil and gas production systems:

- Oil and Gas Wells
- Oil/water/gas Separation System
- Oil and Water Storage System
- Produced Gas Flaring System
- Vapor Recovery System
- Oil Shipping System
- Wastewater Treatment System

There are seventeen (17) oil and gas wells located at the Barham/Boyne Lease. Several wells are equipped with downhole pumps driven by an internal combustion engine to enhance well productivity. The engines driving these pumps are permitted under Pt70 PTO 15074. Produced well fluids are processed through gas/liquid separators then enter a heated wash tank. Crude oil is sent to crude oil storage tanks then trucked offsite and produced gas is burned in the flare. Produced water is treated in wastewater tanks and trucked offsite. The tanks are connected to a vapor recovery system. Vapors collected by the vapor recovery unit are burned the flare.

1.2.2 Facility Permitting History: The following permits have been issued for this facility:

PERMIT	FINAL ISSUED	PERMIT DESCRIPTION
ATC 7494	2/15/1989	ATC for a new oil and gas facility.
PTO 7494	8/14/1990	PTO for a new oil and gas facility.
ATC 8540	7/8/1991	ATC for wells and processing equipment.
ATC 8269	1/3/1991	ATC for wells and processing equipment.
PTO 8269	9/4/1991	PTO for wells and processing equipment.
PTO 8269 R1	6/1/1995	Permit Reevaluation
PTO 8269 R2	12/30/1997	Permit Reevaluation
ATC/PTO 9747	8/18/1997	Return Well Cellars to Service
PTO 8269 R3	10/27/2000	Permit Reevaluation
PTO 8269 R4	9/16/2003	Permit Reevaluation
PTO 8269 R5	9/5/2006	Permit Reevaluation
PTO 8269 R6	2/17/2010	Permit Reevaluation

[1] District Rule 102, Definition: "Northern Zone"

PERMIT	FINAL ISSUED	PERMIT DESCRIPTION
PTO 8269 R7	12/12/2012	Permit Reevaluation
PTO 8269 R8	9/30/2015	Permit Reevaluation
ATC/PTO 10968	4/16/2003	Install Well Otec #1
ATC 11978	4/20/2006	Install a Wash Tank.
ATC 12243	10/17/2007	Install a 3.5 MMBtu/hr Boiler
PTO 12243	6/9/2009	Operate a 3.5 MMBtu/hr Boiler
ATC 13868	11/5/2012	Install Well Barham #9
ATC 13869	11/5/2012	Install Well Barham #11
ATC 14762	6/15/2016	Wastewater tank

1.3 Emission Sources

The emissions at the Barham/Boyne Lease include oil and gas wells and their associated cellars, oil/water/gas separation equipment, production flare, tank heater, boiler, tanks and fugitive emission components such as valves and flanges. Section 4 of the permit provides the District's engineering analysis of these emission sources. Section 5 of the permit describes the allowable emissions from each permitted emissions unit and also lists the potential emissions from non-permitted emission units.

The emission sources include:

- Seventeen (17) oil and gas wells and well cellars
- Three (3) crude shipping tank
- One (1) wastewater tank
- One (1) wash tank
- One production flare
- One tank heater
- Hot water boiler
- Crude oil loading rack
- Fugitive emission components in gas/liquid hydrocarbon service

A list of all permitted equipment is provided in Section 10.4.

1.4 Emission Control Overview

The emission controls employed at this facility include:

- A Fugitive Inspection & Maintenance program for detecting and repairing leaks of hydrocarbons from piping components, i.e., valves, flanges and seals, consistent with the requirements of the District Rule 331 to reduce ROC emissions by approximately 80-percent.

- The boiler is equipped with a low-NOx burner.

- A vapor recovery/gas collection (VRGC) system to collect reactive organic vapors from the gas/liquid separators and the tanks.

- A program to keep well cellars pumped out consistent with the requirements of District Rule 344.
- The flare is equipped with the technology standards required by Rule 359.

1.5 Offsets/Emission Reduction Credit Overview

The Barham Ranch Stationary Source exceeds the offset thresholds of Regulation VIII for NO_x and ROC emissions, however, this is a result of the District determination that the Barham/Boyne and Barham/Boyne leases comprise a single stationary source. There have been no New Source Review permit actions since this determination was made therefore no emission offsets are required for the emissions associated with this permit.

1.6 Part 70 Operating Permit Overview

1.6.1 Federally-enforceable Requirements: All federally-enforceable requirements are listed in 40 CFR Part 70.2 (*Definitions*) under "applicable requirements". These include all SIP-approved District Rules, all conditions in the District-issued Authority to Construct permits, and all conditions applicable to major sources under federally promulgated rules and regulations. All these requirements are enforceable by the public under CAAA. (*See Tables 3.1 and 3.2 for a list of federally-enforceable requirements)*

1.6.2 Insignificant Emissions Units: Insignificant emission units are defined under District Rule 1301 as any regulated air pollutant emitted from the unit, excluding HAPs, that are less than 2 tons per year based on the unit's potential to emit and any HAP regulated under section 112(g) of the Clean Air Act that does not exceed 0.5 ton per year based on the unit's potential to emit. Insignificant activities were listed in the Part 70 permit application. See Attachment 10.6 for a list of insignificant emissions units.

1.6.3 Federal Potential to Emit: The federal potential to emit (PTE) of a stationary source does not include fugitive emissions of any pollutant, unless the source is: (1) subject to a federal NSPS/NESHAP requirement which was in effect as of August 7, 1980, or (2) included in the 29-category source list specified in 40 CFR 51.166 or 52.21. The federal PTE does include all emissions from any insignificant emissions units. (See Section 5.4 for the federal PTE for this source.

1.6.4 Permit Shield: The operator of a major source may be granted a shield: (a) specifically stipulating any federally-enforceable conditions that are no longer applicable to the source and (b) stating the reasons for such non-applicability. The permit shield must be based on a request from the source and its detailed review by the District. Permit shields cannot be indiscriminately granted with respect to all federal requirements. Sierra Resources has not made a request for a permit shield.

1.6.5 Alternate Operating Scenarios: A major source may be permitted to operate under different operating scenarios, if appropriate descriptions of such scenarios are included in its Part 70 permit application and if such operations are allowed under federally-enforceable rules. Sierra Resources made no request for permitted alternative operating scenarios.

1.6.6 Compliance Certification: Part 70 permit holders must certify compliance with all applicable federally-enforceable requirements including permit conditions. Such certification must accompany each Part 70 permit application and be re-submitted annually on the anniversary date of the permit or on a more frequent schedule specified in the permit. A "responsible official" of the owner/operator company signs each certification whose name and address is listed prominently in the Part 70 permit. (*see Section 1.6.9 below)*

1.6.7 Permit Reopening: Part 70 permits are re-opened and revised if the source becomes subject to a new rule or new permit conditions are necessary to ensure compliance with existing rules. The

permits are also re-opened if they contain a material mistake or the emission limitations or other conditions are based on inaccurate permit application data.

1.6.8 Hazardous Air Pollutants (HAPs): Part 70 permits also regulate emission of HAPs from major sources through the imposition of maximum achievable control technology (MACT), where applicable. The federal PTE for HAP emissions from a source is computed to determine MACT or any other rule applicability. The Barham Ranch Stationary Source is not considered a major source of HAPs. *(see Sections 4.12 and 5.5)*

1.6.9 Responsible Officials: The designated responsible official is:

Mr. Doug Eberts, Chief Financial Officer
Sierra Resources, Inc.
P. O. Box 2788
Mammoth Lakes, CA 93546

2.0 Process Description

2.1 Process Summary

2.1.1 Crude Oil Production and Separation: Oil, water, and gas are produced from wells located on the Barham/Boyne leases. The wells are equipped with well cellars. Each well is also equipped with an electric well pump or pump powered by internal combustion engine. The engines are permitted under a separate permit. Produced well fluids are piped to a central processing facility where they enter a three-phase separator. The separated liquids are piped to the heater treater for further separation. Fluids are piped from the heater treater to either the wash tank or one of three crude storage tanks. A boiler is used to heat the wash tank fluids to aid separation and to lower the viscosity of the oil prior to shipping. Produced water is sent to the wastewater storage tank. The wastewater collected from the tanks is removed from the property by the use of the wastewater loading rack. Gas collected from the separator and the heater treater is metered and then burned as fuel in the internal combustion engines, the heater treater, or the boiler. Gas collected by the casing head gas collection system and the vapor recovery system is burned in the flare.

2.1.2 Gas, Oil, and Water Separation: Produced oil, water and gas are processed through gas/liquid separators then transferred to a heated wash tank. The oil is sent to the crude oil storage tanks and produced gas is burned in the tank heater or flared in the production flare. Produced water is sent to the wastewater tank.

2.1.3 Vapor Recovery: The tanks are connected to a vapor recovery system (VRS). The VRS is equipped with a compressor driven by a 15 hp electric motor. The vapors are flared.

2.1.4 Crude Oil Shipping: Oil from the crude storage tank is shipped offsite by tanker truck via the crude oil loading rack.

2.1.5 Wastewater Disposal: Produced water is shipped offsite by tanker truck.

2.2 Support Systems

There are no additional support systems on the Barham/Boyne Lease.

2.3 Maintenance/Degreasing Activities

2.3.1 Paints and Coatings: Intermittent surface coating operations are conducted throughout the facility for occasional structural and equipment maintenance needs, including architectural coating. Normally only touch-up and equipment labeling or tagging is performed. All architectural coatings used are in compliance with District Rule 323, as verified through the rule-required recordkeeping.

2.3.2 Solvent Usage: Solvents not used for surface coating thinning may be used on the Barham/Boyne Lease for daily operations. Usage includes cold solvent degreasing and wipe cleaning with rags.

2.4 Planned Process Turnarounds

Maintenance of critical components is carried out according to the requirements of Rule 331 (*Fugitive Emissions Inspection and Maintenance*) during turnarounds. Sierra Resources did not list any emissions from planned process turnarounds.

2.5 Other Processes

2.5.1 Unplanned Activities/Emissions: Sierra Resources does not anticipate or foresee any circumstances that would require special equipment use and result in excess emissions.

2.6 Detailed Process Equipment Listing

Refer to Attachment 10.4 for a complete listing of all permitted equipment.

3.0 Regulatory Review

This Section identifies the federal, state and local rules and regulations applicable to the Barham/Boyne Lease.

3.1 Rule Exemptions Claimed

District Rule 202 *Exemptions to Rule 201*: Sierra Resources has requested the following exemptions under this rule. An exemption from permit, however, does not necessarily grant relief from any applicable prohibitory rule. The District approved the following exemptions:

- Abrasive Blasting Unit (Rule 202.H.3)
- Storage of Drums of Lubrication Oils (Rule 202.V.3)
- Storage of various types of oils with Initial Boiling Point 300° F or greater (Rule 202.V.1)
- Painting and Solvent Use for Maintenance Activities (Rule 202.D.8)

3.2 Compliance with Applicable Federal Rules and Regulations

3.2.1 40 CFR Parts 51/52 *{New Source Review (Nonattainment Area Review and Prevention of Significant Deterioration)}*: Compliance with District Regulation VIII (*New Source Review*), ensures that future modifications to the facility will comply with these regulations.

3.2.2 40 CFR Part 60 *{New Source Performance Standards}*: The crude oil storage tanks at the Barham/Boyne Lease are not subject to this subpart because they have a design volume less than 1,589.874 m^3 (10,000 bbls) and are located prior to custody transfer.

3.2.3 40 CFR Part 61 *{NESHAP}*: This facility is not currently subject to the provisions of this Subpart.

3.2.4 40 CFR Part 63 *{MACT}*: On June 17, 1999, EPA promulgated Subpart HH, a National Emission Standards for Hazardous Air Pollutants (NESHAPS) for Oil and Natural Gas Production and Natural Gas Transmission and Storage. The stationary source is not considered a major source of HAPS, therefore the only affected source (equipment) subject to requirements of this subpart for area sources are triethylene glycol (TEG) dehydration units per section 63.760(b)(2). Since there are no TEG units at this facility, the facility is not subject to this MACT per section 63.760(d).

3.2.5 40 CFR Part 64 *{Compliance Assurance Monitoring}*: This rule became effective on April 22, 1998 and affects emission units at the source subject to a federally enforceable emission limit or standard that use a control device to comply with the emission standard, and either pre-control or post-control emissions exceed the Part 70 source emission thresholds. Compliance with this rule was evaluated and it was determined that no emission units at this facility are currently subject to CAM.

3.2.6 Subpart ZZZZ *{NESHAP - Stationary Internal Combustion Engines}:* There are no emission units on this permit subject to this MACT.

3.2.7 Subpart DDDDD *{Industrial/Commercial/Institutional Boilers and Process Heaters}*: The external combustion equipment associated with this source is not subject to this MACT.

3.2.8 Subpart EEEE *{Organic Liquid Distribution}:* There are no emission units on this permit subject to this MACT.

3.2.9 40 CFR Part 70 *{Operating Permits}*: This subpart is applicable to the Barham/Boyne Lease. Table 3.1 lists the federally-enforceable District promulgated rules that are "generic" and apply to the Barham/Boyne Lease. Table 3.2 lists the federally-enforceable District promulgated rules that are "unit-specific" that apply to the Barham/Boyne Lease. These tables are based on data available from the District's administrative files and from the Part 70 Operating Permit application.

In its Part 70 permit application (Form I) Sierra Resources certified compliance with all existing District rules and permit conditions. This certification is also required of Sierra Resources semi-annually. Issuance of this permit and compliance with all its terms and conditions will ensure that Sierra Resources complies with the provisions of all applicable subparts.

3.3 Compliance with Applicable State Rules and Regulations

3.3.1 Division 26: Air Resources {California Health & Safety Code}: The administrative provisions of the Health & Safety Code apply to this facility and will be enforced by the District. These provisions are District-enforceable only.

3.3.2 California Administrative Code Title 17: These sections specify the standards by which abrasive blasting activities are governed throughout the State. All abrasive blasting activities at the Barham/Boyne Lease are required to conform to these standards. Compliance will be assessed through onsite inspections. These standards are District-enforceable only. However, CAC Title 17 does not preempt enforcement of any SIP-approved rule that may be applicable to abrasive blasting activities.

3.3.3 Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities (CCR Title 17, Section 95665 *et. Seq.*): On October 1, 2017, the California Air Resources Board (CARB) finalized this regulation, which establishes greenhouse gas emission standards for onshore and offshore crude oil and natural gas production facilities. This facility is subject to the provisions of this regulation. The separators and tanks at this facility satisfy the requirements of the CARB regulation through the use of a vapor collection system. The reciprocating natural gas compressor at this facility satisfies the requirements of the CARB regulation through the implementation of leak detection and repair (LDAR) on the rod packing/seals pursuant to District Rule 331. This facility is exempt from the leak detection and repair (LDAR) requirements of the CARB regulation per Section 95669(b)(1), which exempts components, including components found on tanks, separators, wells and pressure vessels, that are subject to District Rule 331 LDAR requirements prior to January 1, 2018. This facility does not utilize circulation tanks for well stimulation treatments, centrifugal natural gas compressors, natural gas powered pneumatic devices or pumps, natural gas only wells, or well casing vents, and is therefore not subject to the CARB regulation standards and requirements for these equipment and processes.

3.4 Compliance with Applicable Local Rules and Regulations

3.4.1 Applicability Tables: In addition to Tables 3.1 and 3.2, Table 3.3 lists the non-federally-enforceable District promulgated rules that apply to the Barham/Boyne Lease.

3.4.2 Rules Requiring Further Discussion: This section provides a detailed discussion regarding the applicability and compliance of certain rules. The following is a rule-by-rule evaluation of compliance for this facility:

District Rule 210 - Fees: Pursuant to Rule 201.G, District permits are reevaluated every three years. This includes the re-issuance of the underlying permit to operate. Also included are the PTO fees. The fees for this facility are based on District Rule 210, Fee Schedule A, however, Part 70 specific costs are based on cost reimbursement provisions (Rule 210.C).

District Rule 301 - Circumvention: This rule prohibits the concealment of any activity that would otherwise constitute a violation of Division 26 (Air Resources) of the California H&SC and the District rules and regulations. To the best of the District's knowledge, the permittee is operating in compliance with this rule.

District Rule 302 - Visible Emissions: This rule prohibits the discharge from any single source any air contaminants for which a period or periods aggregating more than three minutes in any one hour which is as dark or darker in shade than a reading of 1 on the Ringlemann Chart or of such opacity to obscure an observer's view to a degree equal to or greater than a reading of 1 on the Ringlemann Chart. All internal combustion engines (ICE) are subject to this rule. The ICEs associated with the Barham Ranch Stationary Source are permitted on pt70 PTO 15074. The requirement of this rule are addressed in that permit.

District Rule 303 (Nuisance): Rule 303 prohibits any source from discharging such quantities of air contaminants or other material in violation of Section 41700 of the Health and Safety Code which cause injury, detriment, nuisance or annoyance to any considerable number of persons or to the public or which endanger the comfort, repose, health or safety or any such persons or the public or which cause or have a natural tendency to cause injury or damage to business or property. Compliance with this rule is assessed through the District's enforcement staff's

complaint response program. Based on the source's location, the potential for public nuisance is small.

District Rule 304 (Particulate Matter - Northern Zone): A person shall not discharge into the atmosphere from any source particulate matter in excess of 0.3 grain per cubic foot of gas at standard conditions.

District Rule 309 - Specific Contaminants: Under Section "A", no source may discharge sulfur compounds and combustion contaminants (particulate matter) in excess of 0.2-percent as SO_2 (by volume) and 0.3 gr/scf (at 12% CO_2) respectively.

District Rule 310 - Odorous Organic Compounds: This rule prohibits the discharge of H_2S and organic sulfides that result in a ground level impact beyond the property boundary in excess of either 0.06 ppmv averaged over 3 minutes and 0.03 ppmv averaged over 1 hour. No measured data exists to confirm compliance with this rule.

District Rule 311 - Sulfur Content of Fuels: This rule limits the sulfur content of fuels combusted on the Barham/Boyne Lease to 0.5-percent (by weight) for liquids fuels and 12.5 gr/100 scf (calculated as H_2S) {or 200 ppmvd} for gaseous fuels.

District Rule 317 - Organic Solvents: This rule sets specific prohibitions against the discharge of emissions of both photochemically and non-photochemically reactive organic solvents (40 lb/day and 3,000 lb/day respectively). Solvents may be used on the lease during normal operations for degreasing by wipe cleaning and for use in paints and coatings in maintenance operations. There is the potential to exceed the limits under Section B.2 during significant surface coating activities. Sierra Resources is required to maintain records to ensure compliance with this rule.

District Rule 321 - Solvent Cleaning Operations: This rule was revised to fulfill the commitment in the Clean Air Plans to implement requirements for solvent cleaning machines and solvent cleaning. The revised rule contains solvent reactive organic compounds (ROCs) content limits, revised requirements for solvent cleaning machines, and sanctioned solvent cleaning devices and methods. These provisions apply to solvent cleaning machines and wipe cleaning.

District Rule 322 - Metal Surface Coating Thinner and Reducer: This rule prohibits the use of photochemically reactive solvents for use as thinners or reducers in metal surface coatings. Sierra Resources will be required to maintain records during maintenance operations to ensure compliance with this rule.

District Rule 323 - Architectural Coatings: This rule sets standards for the application of surface coatings. The primary coating standard that will apply to the lease is for Industrial Maintenance Coatings which has a limit of 250 grams ROC per liter of coating, as applied. The permittee will be required to comply with the Administrative requirements under Section F for each container on the lease.

District Rule 324 - Disposal and Evaporation of Solvents: This rule prohibits any source from disposing more than one and a half gallons of any photochemically reactive solvent per day by means that will allow the evaporation of the solvent into the atmosphere. Sierra Resources is required to maintain records to ensure compliance with this rule.

District Rule 325 - Crude Oil Production and Separation: This rule, adopted January 25, 1994, applies to equipment used in the production, gathering, storage, processing and separation of crude oil and gas prior to custody transfer. The primary requirements of this rule are under Sections D and E. Section D requires the use of vapor recovery systems on all tanks and vessels, including wastewater tanks, oil/water separators and sumps. Section E requires that all produced gas be controlled at all times, except for wells undergoing routine maintenance. All of the tanks on this lease are all connected to the vapor recovery system. Compliance with Section E is met by directing all produced gas to a flare relief system.

District Rule 326 - Storage of Reactive Organic Liquids: This rule applies to equipment used to store reactive organic compound liquids with a vapor pressure greater than 0.5 psia. The tanks on the Barham/Boyne Lease are subject to Rule 325, and are therefore are not subject to this rule per Section B.1.c.

District Rule 330 - Surface Coating of Metal Parts and Products: This rule sets standards for many types of coatings applied to metal parts and products. In addition to the ROC standards, this rule sets operating standards for application of the coatings, labeling and recordkeeping. Compliance with this rule will be demonstrated through inspections and recordkeeping.

District Rule 331 - Fugitive Emissions Inspection and Maintenance: This rule applies to components in liquid and gaseous hydrocarbon service at oil and gas production fields. Ongoing compliance with the provisions of this rule will be assessed via inspection by District personnel using an organic vapor analyzer, analysis of operator records and the District-approved Fugitive Hydrocarbon Inspection and Maintenance Plan. The Barham/Boyne Lease does not perform any routine venting of hydrocarbons to the atmosphere. All gases routinely vented are directed to the vapor recovery system.

District Rule 342 - Control of Oxides of Nitrogen from Boilers, Steam Generators and Process Heaters: This rule applies to boilers, steam generators and process heaters with rated heat inputs greater than or equal to 5 million Btu per hour used in all industrial, institutional and commercial operations. There are no units subject to this rule on the Barham/Boyne lease.

District Rule 343 - Petroleum Storage Tank Degassing: This rule applies to the degassing of any above-ground tank, reservoir or other container of more than 40,000 gallons capacity containing any organic liquid with a vapor pressure greater than 2.6 psia or between 20,000 gallons and 40,000 gallons capacity containing any organic liquid with a vapor pressure greater than 3.9 psia. This rule is not applicable to the tanks at the Barham/Boyne Lease.

District Rule 344 - Sumps, Pits and Well Cellars: Rule 344 requires controls on sumps and pits subject to the rule and an inspection and maintenance plan for well cellars. There are no sumps or pits at the Barham/Boyne Lease.

District Rule 352 - Natural Gas-Fired Fan-Type Central Furnaces and Small Water Heaters: This rule applies to new water heaters rated less than 75,000 Btu/hr and new fan-type central furnaces. There are no units subject to this rule at the Barham/Boyne Lease.

District Rule 353 - Adhesives and Sealants: This rule is applicable to any person who supplies, sells, offers for sale, manufactures, solicits the application of, or uses adhesives, adhesive bonding primers, adhesive primers, sealants, sealant primers, or any other primers, unless otherwise

specifically exempted by this rule. Compliance with this rule will be demonstrated through inspections and recordkeeping.

Rule 359 - Flare and Thermal Oxidizers. This rule applies to the use of flares and thermal oxidizers located at oil and gas production and processing facilities, refineries, transportation facilities, and trade locations. The flare is subject to this rule. The flare is equipped with an auto-igniter and is air-assisted for smokeless operation as required by Rule 359.

Rule 360 - Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers. This rule applies to the any water heater, boiler, steam generator or process heater for use within the District with a rated heat input capacity greater than or equal to 75,000 BTU/hr up to and including 2.00 MMBTU/hr. The 1.37 MMBtu/hr heater treater was installed prior to the rule adoption date and is therefore not subject to this rule.

Rule 361- Small Boilers, Process Heaters and Steam Generators: Adopted on January 17, 2008 this rule includes requirements for existing units and new/modified units. Units installed prior to January 17, 2008 are designated as existing units. The 3.500 MMBtu/hr boiler is subject to this rule. On or before January 30, 2019, the permittee is required to apply for an Authority to Construct permit to replace or modify the unit to bring it into compliance with the Rule 361 emission standards. On or before January 1, 2020, the owner or operator of any unit must demonstrate final compliance with Rule 361.

District Rule 505 - Breakdown Conditions: This rule describes the procedures that Sierra Resources must follow when a breakdown condition occurs to any emissions unit associated with the Barham/Boyne Lease. A breakdown condition is defined as an unforeseeable failure or malfunction of (1) any air pollution control equipment or related operating equipment which causes a violation of an emission limitation or restriction prescribed in the District Rules and Regulations, or by State law, or (2) any in-stack continuous monitoring equipment, provided such failure or malfunction:

a. Is not the result of neglect or disregard of any air pollution control law or rule or regulation;

b. Is not the result of an intentional or negligent act or omission on the part of the owner or operator;

c. Is not the result of improper maintenance;

d. Does not constitute a nuisance as defined in Section 41700 of the Health and Safety Code;

e. Is not a recurrent breakdown of the same equipment.

District Rule 810 - Federal Prevention of Significant Deterioration: This rule was adopted January 20, 2011 to incorporate the federal Prevention of Significant Deterioration rule requirements into the District's rules and regulations. Future projects at the facility will be evaluated to determine whether they constitute a new major stationary source or a major modification.

3.5 *Compliance History*

This section contains a summary of the compliance history for this facility and was obtained from documentation contained in the District's administrative file.

3.5.1 Facility Inspections: Routine facility inspections are conducted annually at this facility. Inspection reports for these inspections were reviewed as part of the issuance of this permit. With the exception of the enforcement action described below in Section 3.5.2 there were no other significant issues reported as a result of these inspections.

3.5.2 Violations: District records indicate that one enforcement action has been issued to this facility:

NOV #10934: Issued 12/01/2015 for operating internal combustions engines without a District permit.

3.5.3 Variances: There have been no variances issued to this facility since the last permit reevaluation

3.5.4 Significant Historical Hearing Board Actions: There have been no significant Hearing Board actions since the previous permit reevaluation.

Table 3.1 - Generic Federally-Enforceable District Rules

Generic Requirements	Affected Emission Units	Basis for Applicability	Adoption Date
RULE 101: Compliance by Existing Installations	All emission units	Emission of pollutants	June 21, 2012
RULE 102: Definitions	All emission units	Emission of pollutants	August 25, 2016
RULE 103: Severability	All emission units	Emission of pollutants	October 23, 1978
RULE 201: Permits Required	All emission units	Emission of pollutants	June 19, 2008
RULE 202: Exemptions to Rule 201	Applicable emission units, as listed in form 1302-H of the Part 70 application.	Insignificant activities/emissions, per size/rating/function	August 25, 2016
RULE 203: Transfer	All emission units	Change of ownership	April 17, 1997
RULE 204: Applications	All emission units	Addition of new equipment of modification to existing equipment.	August 25, 2016
RULE 205: Standards for Granting Permits	All emission units	Emission of pollutants	April 17, 1997
RULE 206: Conditional Approval of Authority to Construct or Permit to Operate	All emission units	Applicability of relevant Rules	October 15, 1991
RULE 207: Denial of Applications	All emission units	Applicability of relevant Rules	October 23, 1978
RULE 208: Action on Applications – Time Limits	All emission units. Not applicable to Part 70 permit applications.	Addition of new equipment of modification to existing equipment.	April 17, 1997
RULE 212: Emission Statements	All emission units	Administrative	October 20, 1992
RULE 301: Circumvention	All emission units	Any pollutant emission	October 23, 1978
RULE 302: Visible Emissions	All emission units	Particulate matter emissions	June 1981
RULE 303: Nuisance	All emission units	Emissions that can injure, damage or offend.	October 23, 1978
RULE 304: Particulate Matter – Northern Zone	Each PM Source	Emissions of PM in effluent gas	October 23, 1978
RULE 309: Specific Contaminants	All emission units	Combustion contaminant emission	October 23, 1978
Rule 310: Odorous Organic Sulfides	All emission units	Combustion contaminant emission	October 23, 1978
RULE 311: Sulfur Content of Fuel	All combustion units	Use of fuel containing sulfur	October 23, 1978

Generic Requirements	Affected Emission Units	Basis for Applicability	Adoption Date
RULE 317: Organic Solvents	Emission units using solvents	Solvent used in process operations.	October 23, 1978
RULE 321: Solvent Cleaning Operations	Emission units using solvents.	Solvent used in process operations.	June 21, 2012
RULE 322: Metal Surface Coating Thinner and Reducer	Emission units using solvents.	Solvent used in process operations.	October 23, 1978
RULE 323.1: Architectural Coatings	Paints used in maintenance and surface coating activities.	Application of architectural coatings.	June 19, 2014
RULE 324: Disposal and Evaporation of Solvents	Emission units using solvents.	Solvent used in process operations.	October 23, 1978
RULE 342: Control of Oxides of Nitrogen (NO_x) from Boilers Steam Generators and Process Heaters.	Control heat inputs greater than or equal to 5 million Btu per hour	Process heaters and steam generators.	April 17, 1997
RULE 353: Adhesives and Sealants	Emission units using adhesives and solvents.	Adhesives and sealants used in process operations.	June 21, 2012
RULE 505.A, B1, D: Breakdown Conditions	All emission units	Breakdowns where permit limits are exceeded or rule requirements are not complied with.	October 23, 1978
RULE 603: Emergency Episode Plans	Stationary sources with PTE greater than 100 tpy	Barham Ranch is a major source.	June 15, 1981
RULE 810: Federal Prevention of Significant Deterioration	New or modified emission units	Major modifications	June 20, 2013
REGULATION VIII: New Source Review	All emission units	Addition of new equipment of modification to existing equipment. Applications to generate ERC Certificates.	August 25, 2016
RULE 901: New Source Performance Standards (NSPS)	All emission units	Applicability standards are specified in each NSPS.	September 20, 2010
RULE 1001: National Emission Standards for Hazardous Air Pollutants (NESHAPS)	All emission units	Applicability standards are specified in each NESHAP.	October 23, 1993
REGULATION XIII (RULES 1301-1305): Part 70 Operating Permits	All emission units	Barham Ranch is a major source.	January 18, 2001

Table 3.2 - Unit-Specific Federally-Enforceable District Rules

Unit-Specific Requirements	Affected Emission Units	Basis for Applicability	Adoption Date
RULE 325: Crude Oil Production and Separation	Wash tank, crude storage tanks, wastewater tanks	Pre-custody transfer oil service tanks with capacities exceeding exemption limits.	January 18, 2001
RULE 331: Fugitive Emissions Inspection & Maintenance	All components (valves, flanges, seals, compressors and pumps) used to handle oil and gas:	Components emit fugitive ROCs.	Dec 10, 1991
RULE 343: Petroleum Storage Tank Degassing	Wash tank, crude storage tanks, wastewater tanks	Tanks used in storage of organic liquids with vapor pressure > 2.6 psia.	Dec 14, 1993
RULE 344: Petroleum Wells, Sumps and Cellars	Well cellars, sump, wastewater pits	The wells at this facility are equipped with well cellars. Compliance with this rule provides a 70% reduction in well cellar ROC emissions.	Nov 10, 1994
Rule 360: Emissions of Oxides of Nitrogen From Large Water Heaters and Small Boilers	Water heaters, boilers, steam generators or process heaters rated input capacity 75,000 - 2.0 MMBtu/hour	Any new equipment item covered by this rule must certify compliance with the rule emission limits.	March 15, 2018
Rule 361: Small boilers, steam generators and process heaters	Small boilers, steam generators or process heaters rated input capacity 2.0 -5.0 MMBtu/hour	Existing equipment item covered by this rule.	January 17, 2008

Table 3.3 - Non-Federally-Enforceable District Rules

Requirement	Affected Emission Units	Basis for Applicability	Adoption Date
RULE 210: Fees	All emission units	Administrative	March 17, 2005
RULE 212: Emission Statements	All emission units	Administrative	October 20, 1992
RULE 310: Odorous Organic Sulfides	All emission units	Emission of organic sulfides	October 23, 1978
RULE 361: Small Boilers, Steam Generators, and Process Heaters.	Any boiler, steam generator, and process heater with a rated heat input capacity greater than 2 MMBtu/hr and less than 5 MMBTU/hr.	Any equipment item covered by this rule must comply with the rule emission limits.	January 17, 2008
RULES 501-504: Variance Rules	All emission units	Administrative	October 23, 1978
RULE 505.B2, B3, C, E, F, G: Breakdown Conditions	All emission units	Equipment Malfunctions.	October 23, 1978

Requirement	Affected Emission Units	Basis for Applicability	Adoption Date
RULES 506-519: Variance Rules	All emission units	Administrative	October 23, 1978

4.0 Engineering Analysis

4.1 General

The engineering analyses performed for this permit were limited to the review of:

- facility process flow diagrams
- emission factors and calculation methods for each emissions unit
- rule applicability for each emissions unit and process
- emission control equipment (including RACT, BACT, NSPS, NESHAP, MACT)
- emission source testing, sampling, CEMS, CAM
- process monitors needed to ensure compliance

Unless noted otherwise, default ROC/THC reactivity profiles from the District's document titled "*VOC/ROC Emission Factors and Reactivities for Common Source Types*" dated July 13, 1998 (ver 1.1) was used to determine non-methane, non-ethane fraction of THC.

4.2 External Combustion Equipment

Heater Treater: The heater treater is a 1.37 MMbtu/hr Lo-NOx unit utilized to heat the fluids to facilitate the separation process. This unit is not subject to any District rule emission limits. The emission factors for all the pollutants, e.g., NO_X, ROC, CO and $PM/PM_{10/2.5}$ are based on USEPA AP-42, Section 1.4, Fifth Edition, November 1995. Sulfur oxide emissions are based on mass balance calculations. The calculation methodology is the same for all the units and follows below (see also Section 10.1):

$$ER = [(EF \times SCFPP \times HHV) \div 10^6]$$

where:

ER = Emission rate (lb/period)
EF = Pollutant specific emission factor (lb/MMBtu)
SCFPP = gas flow rate per operating period (scf/period)
HHV = gas higher heating values (1050 Btu/scf)

Boiler: The boiler is a 3.50 MMbtu/hr unit equipped with a Power Flame Low NOx Burner, Model LNICR3-G-25B used to heat the fluids in the wash tank. This unit is subject to District Rule 361. The emission factors for all the pollutants, e.g., NO_X, ROC, CO and $PM/PM_{10/2.5}$ are based on USEPA AP-42, Section 1.4, Fifth Edition, November 1995. Sulfur oxide emissions are based on mass balance calculations. The calculation methodology is the same for all the units and follows below (see also Section 10.1):

$$ER = [(EF \times SCFPP \times HHV) \div 10^6]$$

where:

ER = Emission rate (lb/period)
EF = Pollutant specific emission factor (lb/MMBtu)

SCFPP = gas flow rate per operating period (scf/period)
HHV = gas higher heating values (1050 Btu/scf)

4.3 Flare

Production Flare: The smokeless, naturally aspirated flare, is a Kaldair model Indair I-6 is equipped with a continuous pilot and electronic ignition and is rated at 17.50 MMBtu/hr. All produced gas at this facility that is not used as fuel is routed to this flare. Emission factors for NO_x and CO are based on AP-42 Table 13.5-1. The ROC factor is based on the District 2016 Flare Study. SO_x emissions are based on mass balance.

The calculation methodology for the flare is:

$$ER = EF \times FPP \times HHV$$

Where:

ER	=	Emission rate (lb/unit time period, i.e.: hrs, day, qtr, yr)
EF	=	Pollutant specific emission factor (lb/MMBtu)
FPP	=	Gas flow rate per operating period (SCF/unit time period)
HHV	=	Fuel high heating value (Btu/SCF)

4.4 Fugitive Hydrocarbon Sources

4.4.1 Piping Components: Emissions of reactive organic compounds from piping components (e.g., valves and connections), pumps, compressors and pressure relief devices have been quantified using emission factors pursuant to District P&P 6100.061.1996 (*Determination of Fugitive Hydrocarbon Emissions at Oil and Gas Facilities Through the Use of Facility Component Counts - Modified for Revised ROC Definition*). The component leak-path counts used in the calculations are based on a revised and corrected inventory compiled by Sierra Resources and included in a revised and District-approved Fugitive Inspection and Maintenance Plan dated July 2017.

The calculation methodology for the fugitive emissions is:

$$ER = [(EF \times CLP \div 24) \times (1 - CE) \times (HPP)]$$

where:

ER = emission rate (lb/period)
EF = ROC emission factor (lb/clp-day)
CLP = component leak-path (clp)
CE = control efficiency
HPP = operating hours per time period (hrs/period)

An emission control efficiency of 80-percent is credited to all but "unsafe to monitor" components due to the implementation of a District-approved I&M program consistent with Rule 331 requirements. Detailed fugitive emission calculations are attached in Attachment 10.2. Ongoing compliance is determined in the field by inspection with an organic vapor analyzer and verification of operator records.

4.4.2 Well Cellars: The Barham/Boyne Lease is equipped with sixteen (17) well cellars. Well cellar emissions are assumed to be reduced 70-percent for maintaining this equipment consistent with Rule 344. The emission estimates are based District P&P 6100.060 (*Determination of Fugitive Hydrocarbon Emissions at Oil and Gas Facilities by the CARB/KVB Method - Modified for Revised ROC Definition*). The calculation is:

$$ER = [(EF \times SAREA \div 24) \times (1 - CE) \times (HPP)]$$

where:

E = emission rate (lb/period)
EF = ROC emission factor (lb/ft^2-day)
SAREA = unit surface area (ft^2)
CE = control efficiency
HPP = operating hours per time period (hrs/period)

Attachment 10.2 contains an emission spreadsheet showing the detailed calculations for the well cellars.

4.5 Tanks/Vessels/Sumps/Separators

4.5.1 Oil-Water Separation and Crude Oil Storage Tanks: The Barham/Boyne Lease utilizes three 1,000 bbl crude storage tanks. The tanks are vertical, cone roofed measuring 21.5 in feet diameter by 16.0 feet high. There is also one 1500 bbl heated wash tank that measures 21.0 feet in diameter by 24.0 feet high. All tanks are connected to vapor recovery. Emissions from these tanks are calculated using USEPA AP-42, Chapter 7 - Liquid Storage Tanks (5th Edition, 2/96). Attachment 10.2 contains emission spreadsheets showing the detailed calculations for these tanks.

4.5.2 Waste Water Tanks: The Barham/Boyne Lease uses one fixed roof wastewater tank. The tank is 1,000 bbl capacity and measures 21.0 feet in diameter by 16.0 feet high. The tank is connected to vapor recovery. Emissions from the tank are calculated using the same methodology as pits and sumps and is based on District's P&P 6100.060 (*Calculation of Fugitive Hydrocarbon Emissions at Oil and Gas Facilities by the CARB/KVB Method - Modified for the Revised ROC Definition*). Attachment 10.2 contains an emission spreadsheet showing the detailed calculations for the tanks.

4.6 Loading Rack

4.6.1 Loading Rack: Crude oil is delivered offsite via the crude oil loading rack. The loading rack is powered by a pump associated with the tanker truck and is connected to vapor recovery. Attachment 10.2 contains an emission spreadsheet showing the detailed calculations for the loading rack.

4.7 Vapor Recovery/Control Systems

4.7.1 The vapor recovery system (VRS) collects ROC vapors from the storage tanks. It is equipped with a compressor driven by a 15 hp electric motor. The vapors are collected and routed to the

vapor recovery unit flare that is dedicated to the VRU only. Overall ROC control efficiency for the system is assumed to be 95 percent.

4.8 Other Emission Sources

4.8.1 General Solvent Cleaning/Degreasing: Solvent usage (not used as thinners for surface coating) may occur at the facility as part of normal daily operations). The usage includes cold solvent degreasing. Mass balance emission calculations are used assuming all the solvent used evaporates to the atmosphere. The solvent limits in Table 5.2 cannot be exceeded (excluding solvent activities that qualify for the maintenance exemption under Rule 202).

4.8.2 Surface Coating: Surface coating operations typically include normal touch up activities. Entire facility painting programs may also be performed. Emissions are determined based on mass balance calculations assuming all solvents evaporate into the atmosphere. Emissions of PM/PM_{10} from paint overspray are not calculated due to the lack of established calculation techniques.

4.8.3 Abrasive Blasting: Abrasive blasting with CARB certified sands may be performed as a preparation step prior to surface coating. The engines (ICEs) used to power the compressor may be electric or diesel fired. Any ICE used for this purpose will require a permit unless the engine qualifies for a permit exemption. Particulate matter is emitted during this process. A general emission factor of 0.01 pound PM per pound of abrasive is used (SCAQMD - Permit Processing Manual, 1989) to estimate emissions of PM and PM_{10} when needed for compliance verifications. A PM/PM_{10} ratio of 1.0 is assumed.

4.9 BACT/NSPS/NESHAP/MACT

To date, this facility has not triggered Best Available Control Technology (BACT), New Source Performance Standards (NSPS) National Emission Standards for Hazardous Air Pollutants (NESHAP) or Maximum Available Control Technology (MACT).

A National Emission Standards for Hazardous Air Pollutants (NESHAPS) for Oil and Natural Gas Production and Natural Gas Transmission and Storage was promulgated on June 17, 1999. As described in section 3.2.4, this facility is not subject to this MACT.

4.10 CEMS/Process Monitoring/CAM

4.10.1 CEMS: There are no CEMS at this facility.

4.10.2 Process Monitoring: In many instances, ongoing compliance beyond a single (snap shot) source test is assessed by the use of process monitoring systems. Examples of these monitors include: engine hour meters, fuel usage meters, water injection mass flow meters, flare gas flow meters and hydrogen sulfide analyzers. It is important that they be well maintained and calibrated to ensure that the required accuracy and precision of the devices are within specifications. Sierra Resources is required to meter oil and gas productions volumes, fuel flows and flare gas volumes.

4.10.3 CAM: There are no emission units at this facility subject to the USEPA's Compliance Assurance Monitoring Assurance (CAM) rule.

4.11 Source Testing/Sampling

Source testing and sampling are required in order to ensure compliance with permitted emission limits, prohibitory rules, control measures and the assumptions that form the basis for issuing operating permits. This permit requires no source testing.

At a minimum, the process streams below are required to be sampled and analyzed on a periodic basis, per District Rules and standards:

> Produced oil: Analysis for API gravity and true vapor pressure.
> Produced Gas: Monthly analysis of produced gas for hydrogen sulfide (H_2S) content and high heating value.

All sampling and analyses are required to be performed according to District approved procedures and methodologies. Typically, the appropriate ASTM methods are acceptable. For liquids with API gravity over 20, ASTM D323 applies for true vapor pressure (TVP) measurement. In this case, the TVP at the maximum expected temperature shall be calculated from the Reid vapor pressure in accordance with API Bulletin 2518, or equivalent Reid/true vapor pressure correlation. The calculated true vapor pressure is based on the maximum expected operating temperature in the initial crude oil storage tank. TVP sampling methods for liquids with an API gravity under 20^{O} require specialized procedures per Rule 325.G.2.b. It is important that all sampling and analysis be traceable by chain of custody procedures. H_2S measurements are conducted using colorimetric gas detection tubes.

4.12 Part 70 Engineering Review: Hazardous Air Pollutant Emissions

Hazardous air pollutant emissions from the different categories of emission units at the Barham/Boyne Lease are based on emission factors listed in USEPA AP-42. Where no emission factors are available, the HAP fractions from the ARB VOC Speciation Manual - Second Edition (August 1991) are used in conjunction with the ROC emission factor for the equipment item in question. HAP emission factors are listed in Table 5.4-1. Potential HAP emissions from the facility are computed and listed in Table 5.4-2. These emissions are estimates only. They are not limitations.

5.0 Emissions

5.1 General

The facility was analyzed to determine all air-related emission sources. Emissions calculations are divided into "permitted" and "exempt" categories. District Rule 202 determines permit-exempt equipment. The permitted emissions for each emissions unit is based on the equipment's potential-to-emit (as defined by Rule 102). Since the previous permit reevaluation, $PM_{2.5}$ has been added as a regulated pollutant, therefore $PM_{2.5}$ emissions have been quantified.

Section 5.2 details the permitted emissions for each emissions unit. Section 5.3 details the overall permitted emissions for the facility based on reasonable worst-case scenarios using the potential-to-emit for each emissions unit. Section 5.4 details the federal potential to emit using the definition of potential to emit used in Rule 1301. Section 5.5 addresses the estimated HAP emissions from the facility. Section 5.6 addresses the estimated emissions from permit-exempt equipment and also serves as the Part 70 list of insignificant emissions. Section 5.7 addresses the estimated emissions from greenhouse gases. The District uses a computer database to accurately

track the emissions from a facility. Attachment 10.3 contains the District's documentation for the information entered into that database.

5.2 Permitted Emission Limits - Emission Units

Each emissions unit associated with the facility was analyzed to determine the potential-to-emit for the following pollutants:

- Nitrogen Oxides (NO_x) [2]
- Reactive Organic Compounds (ROC)
- Carbon Monoxide (CO)
- Sulfur Oxides (SO_x) [3]
- Particulate Matter (PM) [4]
- Particulate Matter smaller than 2.5 microns ($PM_{2.5}$)
- Particulate Matter smaller than 10 microns ($PM_{2.5/10}$)
- Greenhouse Gases (GHG)

Permitted emissions are calculated for both short term (daily) and long term (annual) time periods. Section 4.0 (Engineering Analysis) provides a general discussion of the basic calculation methodologies and emission factors used. The reference documentation for the specific emission calculations, as well as detailed calculation spreadsheets, may be found in Section 4 and Attachments 10.1 and 10.2 respectively. Table 5.1-1 provides the basic operating characteristics. Table 5.1-2 provides the specific emission factors. Tables 5.1-3 and 5.1-4 show the permitted short-term and permitted long-term emissions for each unit or operation. Table 5.2 lists the facility potential to emit and Table 5.3 lists the federal potential to emit. With the exception of fugitive emissions, all emission limits are federally-enforceable.

5.3 Permitted Emission Limits - Facility Totals

The total potential-to-emit for all emission units associated with this facility were analyzed. This analysis looked at the reasonable worst-case operating scenarios for each operating period. The equipment operating in each of the scenarios are presented below. Unless otherwise specified, the operating characteristics defined in Table 5.1-1 for each emission unit are assumed. Table 5.2 shows the total permitted emissions for the facility.

Daily Scenario:

- External combustion units
- Fugitive components
- Crude oil tanks
- Wash tank
- Waste water tanks, sumps and oil/water separators
- Well cellars
- Loading rack
- Flaring

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[2] Calculated and reported as nitrogen dioxide (NO_2)

[3] Calculated and reported as sulfur dioxide (SO_2)

[4] Calculated and reported as all particulate matter smaller than 100 μm

- Solvent usage

Annual Scenario:

- External combustion units
- Fugitive components
- Crude oil tanks
- Wash tank
- Waste water tanks, sumps and oil/water separators
- Well cellars
- Loading rack
- Flaring
- Solvent usage

5.4 Part 70: Federal Potential to Emit for the Facility

Table 5.3 lists the federal Part 70 potential to emit. Coating emissions, although exempt from permit requirements, are included in the federal potential to emit calculation. Fugitive emissions from the Barham/Boyne Lease emissions units are not counted in the federal definition of potential to emit.

5.5 Part 70: Hazardous Air Pollutant Emissions for the Facility

Hazardous air pollutants (HAP) emission factors, for each type of emissions unit, are listed in Table 5.4-1. Potential HAP emissions, based on the worst-case scenario, are shown in Table 5.4-2.

5.6 Exempt Emission Sources

Per Rule 202, maintenance activities such as painting and surface coating qualify for a permit exemption, but may contribute to facility emissions.

5.7 Greenhouse Gases

GHG emissions from combustion sources are calculated using emission factors found in Tables C-1 and C-2 of 40 CFR Part 98 and global warming potentials found in Table A-1 of 40 CFR Part 98. The follow emission factors apply. The derivation of these emission factors is provided in Attachment 10.1.

External Combustion: 117.10 lbs/MMbtu as CO_2

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Table 5.1-1. Operating Equipment Description

Equipment Category	Description	APCD Device No.	Device Specifications					Usage Data							Reference
			Fuel	HHV (Btu/scf)	ppmv S [6]	Size	Units	Capacity	Units	Emission Reduction %	hr	day	qtr	year	
Combustion: External	Tank Heater	5144	FG	1050	200	1.37	MMBtu/hr	1.37	MMBtu/hr	--	1.00	24	2190	8760	A
	Boiler	110245				3.50	MMBtu/hr	3.50	MMBtu/hr	--	1.00	24	2190	8760	
	Production Flare	3344	FG	1050	200	17.50	MMBtu/hr	17.50	MMBtu/hr	--	1.00	24	2190	8760	
Fugitive Components (District P&P 6100.060)	Valves/Fittings/Wellheads	3338	--	--	--	Valves and fittings		--	--	80%	1.00	24	2190	8760	B
Tanks	Crude Stock Tank	3340	--	--	--	21.5' x 16'		1,000	bbl	95%	1.00	24	2190	8760	
	Crude Stock Tank	8492	--	--	--	21.5' x 16'		1,000	bbl	95%	1.00	24	2190	8760	
	Crude Stock Tank	110246	--	--	--	21.5' x 16'		1,000	bbl	95%	1.00	24	2190	8760	
	Wash Tank	107889	--	--	--	37.5' x 24'		120	bbl	95%	1.00	24	2190	8760	
	Wastewater Tank	3341	--	--	--	8.0' x 16'		120	bbl	95%	1.00	24	2190	8760	
Well Cellars	Well Cellars	6335	--	--	--	424	ft^2			70%	1.00	24	2190	8760	
Loading Rack	Crude Oil Loading Rack	3342	--	--	--	160	bbl/hr			95%	1.00	10	913	3650	F
Solvents	Cleaning/Degreasing	--	--	--	--	various				--	1.00	24	2190	8760	

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Table 5.1-2. Equipment Emission Factors

Equipment Category	Description	Emission Factors								Reference
		NOx	ROC	CO	SOx	PM	$PM_{2.5/10}$	GHG	Units	
Combustion: External	Tank Heater	0.098	0.005	0.0824	0.0342	0.008	0.008	117.00	lb/MMBtu	A
	Boiler	0.098	0.005	0.0824	0.0342	0.008	0.008	117.00	lb/MMBtu	
	Production Flare	0.068	0.200	0.310	0.0342	0.02	0.02	117.00	lb/MMBtu	
Fugitive Components (District P&P 6100.060)	Valves/Fittings/Wellheads	-	1.310	-	-	-	-	-	lb/day-well	B
Tanks	Crude Stock Tank	See Attachment 10.2		-	-	-	-	-	-	
	Crude Stock Tank	See Attachment 10.2		-	-	-	-	-	-	
	Crude Stock Tank	See Attachment 10.2		-	-	-	-	-	-	
	Wash Tank	See Attachment 10.2		-	-	-	-	-	-	
	Wastewater Tank	See Attachment 10.2		-	-	-	-	-	-	
Well Cellars	Well Cellars		0.0941						lb/ft^2day	
Loading Rack	Crude Oil Loading Rack		1.8050						lb/kgal	F
Solvents	Cleaning/Degreasing	various							lb/gal	

Footnotes:
(a) SOx as SO2; NOx as NO2. This applies to all sheets.

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Table 5.1-3. Short Term Emission Limits

Equipment Category	Description	NOx	ROC	CO	SOx	PM	$PM_{2.5/10}$	GHG
		lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Combustion: External	Tank Heater	3.22	0.16	2.71	1.12	0.26	0.26	3846.96
	Boiler	8.23	0.42	6.92	2.87	0.67	0.67	9828.00
	Production Flare	28.56	84.00	130.20	14.36	8.40	8.40	49140.00
Fugitive Components (District P&P 6100.060)	Valves/Fittings/Wellheads	--	4.73					
Tanks	Crude Stock Tank	--	1.21	--	--	--	--	--
	Crude Stock Tank	--	1.21	--	--	--	--	--
	Crude Stock Tank	--	1.21	--	--	--	--	--
	Wash Tank	--	0.03	--	--	--	--	--
	Wastewater Tank	--	0.22	--	--	--	--	--
Well Cellars	Well Cellars	--	17.88	--	--	--	--	--
Loading Rack	Crude Oil Loading Rack	--	1.07	--	--	--	--	--
Solvents	Cleaning/Degreasing	--	Rule 317 Limits	--	--	--	--	--

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Table 5.1-4. Long Term Emission Limits

Equipment Category	Description	NOx	ROC	CO	SOx	PM	$PM_{2.5/10}$	GHG
		TPY	TPY	TPY	TPY	TPY	TPY	TPY
Combustion: External	Tank Heater	0.59	0.03	0.49	0.21	0.05	0.05	702.07
	Boiler	1.50	0.08	1.26	0.52	0.12	0.12	1793.61
	Production Flare	5.21	15.33	23.76	2.62	1.53	1.53	8968.05
Fugitive Components (District P&P 6100.060)	Valves/Fittings/Wellheads	--	0.86	--	--	--	--	--
Tanks	Crude Stock Tank	--	0.22	--	--	--	--	--
	Crude Stock Tank	--	0.22	--	--	--	--	--
	Crude Stock Tank	--	0.22	--	--	--	--	--
	Wash Tank	--	0.02	--	--	--	--	--
	Wastewater Tank	--	0.04	--	--	--	--	--
Well Cellars	Well Cellars	--	3.26	--	--	--	--	--
Loading Rack	Crude Oil Loading Rack	--	1.97	--	--	--	--	--
Solvents	Cleaning/Degreasing	--	0.74	--	--	--	--	--

Pt70 Permit to Operate 15001
Table 5.2. Total Facility Permitted Emissions

Equipment Category	NOx	ROC	CO	SOx	PM	$PM_{2.5/10}$	GHG
External Combustion	40.01	84.58	139.83	18.36	9.34	9.34	62814.96
Fugitive Components - P&P 6100.060	--	4.73	--	--	--	--	--
Tanks	--	3.88	--	--	--	--	--
Well Cellars	--	17.88	--	--	--	--	--
Loading Racks	--	1.07	--	--	--	--	--
Solvents	--	Rule 317 Limits	--	--	--	--	--
Totals (lb/day)	**40.01**	**112.14**	**139.83**	**18.36**	**9.34**	**9.34**	**62814.96**

Equipment Category	NOx	ROC	CO	SOx	PM	$PM_{2.5/10}$	GHG
External Combustion	7.30	15.44	25.52	3.35	1.70	1.70	11463.73
Fugitive Components - P&P 6100.060	--	0.86	--	--	--	--	--
Tanks	--	0.72	--	--	--	--	--
Cellars	--	3.26	--	--	--	--	--
Loading Racks	--	1.97	--	--	--	--	--
Solvents	--	0.74	--	--	--	--	--
Totals (TPY)	**7.30**	**22.25**	**25.52**	**3.35**	**1.70**	**1.70**	**11463.73**

Table 5.3. Federal Potential to Emit

A. Daily

Equipment Category	NOx	ROC	CO	SOx	PM	PM10	GHG
External Combustion	20.64	29.50	33.95	71.65	1.57	1.57	62814.96
Tanks	--	3.66	--	--	--		--
Totals (lb/day)	**20.64**	**33.16**	**33.95**	**71.65**	**1.57**	**1.57**	**62814.96**

B. Annual

Equipment Category	NOx	ROC	CO	SOx	PM	PM10	GHG
External Combustion	3.76	5.39	6.20	13.08	0.29	0.29	11463.73
Tanks	--	0.68	--	--	--	--	--
Totals (TPY)	**3.76**	**6.07**	**6.20**	**13.08**	**0.29**	**0.29**	**11463.73**

Table 5.4-1
Barham Ranch Boyne Lease: Permit to Operate 15001
Equipment Hazardous Air Pollutant Factors

Equipment Category	Description	APCD Device No.	Hexane	Benzene	Toluene	Xylene	Iso-Octane	Formaldehyde	PAHs (not incl. naphthalene)	Naphthalene	Acetaldehyde	Acrolein	1,3-Butadiene	Carbon Tetrachloride	Chloroform	Ethylbenzene	Ethylene Dibromide	Ethylene Dichloride	Methanol	Methylene Chloride	Styrene	Vinyl Chloride	1,1,2,2-Tetrachloroethane	1,1,2-Trichloroethane	1,2-Dichloropropane	1,3-Dichloropropene	Arsenic	Beryllium	Cadmium	Total Chromium	Cobalt	Manganese	Mercury	Nickel	Selenium	Units	References
			Emission Factors																																		
Combustion: External	Tank Heater	005144	6.30E-03	8.00E-03	3.66E-02	2.72E-02	--	1.70E-02	1.00E-04	3.00E-04	4.30E-03	2.70E-03	--	--	--	9.50E-03	--	--	--	--	--	--	--	--	--	--	2.00E-04	1.20E-05	1.10E-03	1.40E-03	8.40E-05	3.80E-04	2.60E-04	2.10E-03	2.40E-05	lb/MMcf	A
	Boiler	110245	6.30E-03	8.00E-03	3.66E-02	2.72E-02	--	1.70E-02	1.00E-04	3.00E-04	4.30E-03	2.70E-03	--	--	--	9.50E-03	--	--	--	--	--	--	--	--	--	--	2.00E-04	1.20E-05	1.10E-03	1.40E-03	8.40E-05	3.80E-04	2.60E-04	2.10E-03	2.40E-05	lb/MMcf	A
	Production Flare	003344	2.90E-02	1.59E-01	5.80E-02	2.90E-02	--	1.17E+00	3.00E-03	1.10E-02	4.30E-02	1.00E-02	--	--	--	1.44E+00	--	--	--	--	--	--	--	--	--	--	2.00E-04	1.20E-05	1.10E-03	1.40E-03	8.40E-05	3.80E-04	2.60E-04	2.10E-03	2.40E-05	lb/MMcf	B
Fugitive Components	Valves/Fittings/Wellheads	003338	1.77E-01	1.79E-03	--	--	1.55E-01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	lb/lb-ROC	C
Tanks	Crude Stock Tank	003340	5.31E-02	2.71E-02	1.58E-02	--	4.52E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	lb/lb-ROC	D
	Crude Stock Tank	008492	5.31E-02	2.71E-02	1.58E-02	--	4.52E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	lb/lb-ROC	D
	Crude Stock Tank	110246	5.31E-02	2.71E-02	1.58E-02	--	4.52E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	lb/lb-ROC	D
	Wash Tank	107880	5.28E-02	2.64E-02	1.65E-02	--	4.95E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	lb/lb-ROC	E
	Wastewater Tank	003341	5.28E-02	2.64E-02	1.65E-02	--	4.95E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	lb/lb-ROC	E
Well Cellars	Well Cellars	006335	5.28E-02	2.64E-02	1.65E-02	--	4.95E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	lb/lb-ROC	E
Loading Rack	Crude Oil Loading Rack	003342	1.77E-01	1.79E-03	--	--	1.56E-01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	lb/lb-ROC	C
Solvents	Cleaning/Degreasing	--	--	5.00E-02	5.00E-02	5.00E-02	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	lb/lb-ROC	F

References:
A1 - VCAPCD AB 2588 Combustion Emission Factors (2001) - Natural Gas Fired External Combustion Equipment (<10 MMBTU/hr)
A2 - USEPA, AP-42 Table 1.4-4. Emission Factors for Metals from Natural Gas Combustion
B1 - VCAPCD AB 2588 Combustion Emission Factors (2001) - Natural Gas Fired External Combustion Equipment (flare)
B2 - USEPA, AP-42 Table 1.4-4. Emission Factors for Metals from Natural Gas Combustion
C - CARB Speciation Manual Second Edition (1991) Profile Number 758 - Oil & Gas Production Fugitives - Liquid Service
D - CARB Speciation Manual Second Edition (1991) Profile Number 297 - Crude Oil Evaporation - Vapor Composite From Fixed Roof Tanks
E - CARB Speciation Manual Second Edition (1991) Profile Number 532 - Oil & Gas Extraction - Well Heads & Cellars/Oil & Water Separation
F - APCD: Solvents assumed to contain 5% benzene, 5% toluene, 5% xylene

Notes:
1. The weight fraction for iso-Octane (i.e., 2,2,4-Trimethylpentane) is based on the conservative assumption that all isomers of octane are iso-Octane.

Table 5.4-2
Barham Ranch Boyne Lease: Permit to Operate 15001
Annual Hazardous Air Pollution Emissions (TPY)

Equipment Category	Description	APCD Device No.	Hexane	Benzene	Toluene	Xylene	Iso-Octane	Formaldehyde	PAHs (not incl. naphthalene)	Naphthalene	Acetaldehyde	Acrolein	1,3-Butadiene	Carbon Tetrachloride	Chloroform	Ethylbenzene	Ethylene Dibromide	Ethylene Dichloride	Methanol	Methylene Chloride	Styrene	Vinyl Chloride	1,1,2,2-Tetrachloroethane	1,1,2-Trichloroethane	1,2-Dichloropropane	1,3-Dichloropropene	Arsenic	Beryllium	Cadmium	Total Chromium	Cobalt	Manganese	Mercury	Nickel	Selenium
Combustion: External	Tank Heater	005144	3.60E-05	4.57E-05	2.09E-04	1.55E-04	--	9.72E-05	5.71E-07	1.71E-06	2.49E-05	1.54E-05	--	--	--	5.43E-05	--	--	--	--	--	--	--	--	--	--	1.14E-06	6.86E-08	6.29E-06	8.00E-06	4.80E-07	2.17E-06	1.49E-06	1.20E-05	1.37E-07
	Boiler	110245	9.20E-05	1.17E-04	5.34E-04	3.97E-04	--	2.48E-04	1.46E-06	4.38E-06	6.28E-05	3.94E-05	--	--	--	1.39E-04	--	--	--	--	--	--	--	--	--	--	2.92E-06	1.75E-07	1.61E-05	2.04E-05	1.23E-06	5.55E-06	3.80E-06	3.07E-05	3.50E-07
	Production Flare	003344	2.12E-03	1.16E-02	4.23E-03	2.12E-03	--	8.53E-02	2.19E-04	8.03E-04	3.14E-03	7.30E-04	--	--	--	1.05E-01	--	--	--	--	--	--	--	--	--	--	1.46E-05	8.76E-07	8.03E-05	1.02E-04	6.13E-06	2.77E-05	1.90E-05	1.53E-04	1.75E-06
Fugitive Components	Valves/Fittings/Wellheads	003338	1.53E-01	1.54E-03	--	--	1.34E-01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Tanks	Crude Stock Tank	003340	1.17E-02	5.97E-03	3.48E-03	--	9.94E-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Crude Stock Tank	008492	1.17E-02	5.97E-03	3.48E-03	--	9.94E-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Crude Stock Tank	110246	1.17E-02	5.97E-03	3.48E-03	--	9.94E-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Wash Tank	107880	1.06E-03	5.28E-04	3.30E-04	--	9.90E-05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Wastewater Tank	003341	2.11E-03	1.06E-03	6.60E-04	--	1.99E-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Well Cellars	Well Cellars	006335	1.72E-01	8.62E-02	5.38E-02	--	1.62E-02	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Loading Rack	Crude Oil Loading Rack	003342	3.46E-01	3.52E-03	--	--	3.06E-01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Solvents	Cleaning/Degreasing	--	--	3.70E-02	3.70E-02	3.70E-02	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		Total Facility HAPs (TPY):	**7.14E-01**	**1.59E-01**	**1.07E-01**	**3.97E-02**	**4.60E-01**	**8.57E-02**	**2.21E-04**	**8.09E-04**	**3.23E-03**	**7.85E-04**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**1.06E-01**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**1.87E-05**	**1.12E-06**	**1.03E-04**	**1.31E-04**	**7.84E-06**	**3.55E-05**	**2.43E-05**	**1.96E-04**	**2.24E-06**

Notes:
1. These are estimates only, and are not intended to represent emission limits.
2. Based on CAAA, Section 112 (n) (4) stipulations, the HAP emissions listed above can not be aggregated at the source for any purpose, including determination of HAP major source status for MACT applicability.
3. Natural gas emission calculations are based on a standard value of 1000 BTU/scf.

Table 5.4-3
Sierra Resources Barham Ranch: Permit to Operate 15001
Stationary Source Hazardous Air Pollutant Emissions (TPY)

Facility	Permit #	Hexane	Benzene	Toluene	Xylene	Iso-Octane	Formaldehyde	PAHs (not incl. napthalene)	Naphthalene	Acetaldehyde	Acrolein	1,3-Butadiene	Carbon Tetrachloride	Chloroform	Ethylbenzene	Ethylene Dibromide	Ethylene Dichloride	Methanol	Methylene Chloride	Styrene	Vinyl Chloride	1,1,2,2-Tetrachloroethane	1,1,2-Trichloroethane	1,2-Dichloropropane	1,3-Dichloropropene	Arsenic	Beryllium	Cadmium	Total Chromium	Cobalt	Manganese	Mercury	Nickel	Selenium	Total - All HAPS
02637 - Blair Lease	**PTO 15000**	8.01E-01	1.76E-01	1.03E-01	4.83E-02	5.83E-01	4.49E-01	1.15E-03	4.22E-03	1.65E-02	3.85E-03	0.00E+00	0.00E+00	0.00E+00	5.54E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.78E-05	4.67E-06	4.28E-04	5.44E-04	3.27E-05	1.48E-04	1.01E-04	8.17E-04	9.33E-06	2.74E+00
03777 - Boyne Lease	**PTO 15001**	7.14E-01	1.59E-01	1.07E-01	3.97E-02	4.60E-01	8.57E-02	2.21E-04	8.09E-04	3.23E-03	7.85E-04	0.00E+00	0.00E+00	0.00E+00	1.06E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.87E-05	1.12E-06	1.03E-04	1.31E-04	7.84E-06	3.55E-05	2.43E-05	1.96E-04	2.24E-06	1.68E+00
11609 - IC Engines	**PTO 15074**	3.77E-02	6.61E-02	3.28E-02	9.12E-03	0.00E+00	1.89E+00	0.00E+00	3.31E-03	2.85E-01	2.65E-01	2.79E-02	2.07E-03	1.60E-03	3.07E-03	2.50E-03	1.44E-03	1.04E-01	5.01E-03	1.87E-03	8.42E-04	2.26E-03	1.80E-03	1.52E-03	1.49E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.74E+00
Total Stationary Source - By Pollutant		**1.55E+00**	**4.01E-01**	**2.43E-01**	**9.71E-02**	**1.04E+00**	**2.42E+00**	**1.37E-03**	**8.34E-03**	**3.05E-01**	**2.70E-01**	**2.79E-02**	**2.07E-03**	**1.60E-03**	**6.64E-01**	**2.50E-03**	**1.44E-03**	**1.04E-01**	**5.01E-03**	**1.87E-03**	**8.42E-04**	**2.26E-03**	**1.80E-03**	**1.52E-03**	**1.49E-03**	**9.64E-05**	**5.79E-06**	**5.30E-04**	**6.75E-04**	**4.05E-05**	**1.83E-04**	**1.25E-04**	**1.01E-03**	**1.16E-05**	**7.16E+00**

Notes:
1. These are estimates only, and are not intended to represent emission limits.
2. Based on CAAA, Section 112 (n) (4) stipulations, the HAP emissions listed above can not be aggregated at the source for any purpose, including determination of HAP major source status for MACT applicability.

6.0 Air Quality Impact Analyses

6.1 Modeling

Air quality modeling has not been required for the Barham/Boyne Lease.

6.2 Increments

An air quality increment analysis has not been required for the Barham/Boyne Lease.

6.3 Monitoring

Air quality monitoring is not required for the Barham/Boyne Lease.

6.4 Health Risk Assessment

The Sierra Resources Barham Ranch Stationary Source is subject to the Air Toxics Hot-Spots Program (AB-2588). A health risk assessment (HRA) for the source was prepared by the District in November 1995 under the requirements of the Air Toxics "Hot Spots" Information and Assessment Act of 1987 (AB 2588). The HRA is based on 1992 toxic emissions inventory data submitted to the District by a previous operator. An earlier HRA, based on 1990 emission data was also prepared by the District for in July 1993. Based on the 1992 toxic emissions inventory, a cancer risk of 3 per million off the property was estimated for the Barham Ranch Stationary Source. Additionally, a chronic risk of 0.05 and an acute risk of 0.04 have been estimated by the District. The cancer and non-cancer chronic risk projections are less than the District's AB-2588 significance thresholds of 10 in a million and 1.0, respectively.

7.0 CAP Consistency, Offset Requirements and ERCs

7.1 General

Santa Barbara County is in attainment of the federal ozone standard but is in nonattainment of the state eight-hour ozone ambient air quality standard. In addition, the County is in nonattainment of the state PM_{10} ambient air quality standards. The County is either in attainment or unclassified with respect to all other ambient air quality standards. Therefore, emissions from all emission units at the stationary source and its constituent facilities must be consistent with the provisions of the USEPA and State approved Clean Air Plans (CAP) and must not interfere with maintenance of the federal ambient air quality standards and progress towards attainment of the state ambient air quality standards. Under District regulations, any modifications at this facility or the Barham Ranch Stationary Source that result in an emissions increase of any nonattainment pollutant exceeding 25 lbs/day must apply BACT (NAR). Additional increases may trigger offsets at the source or elsewhere so that there is a net air quality benefit for Santa Barbara County. These offset threshold levels are 240 lbs/day for all attainment pollutants and precursors (except carbon monoxide and $PM_{2.5}$) and 25 tons/year for all non-attainment pollutants and precursors (except carbon monoxide and $PM_{2.5}$).

7.2 Clean Air Plan

The 2007 Clean Air Plan, adopted by the District Board on August 16, 2007, addressed both federal and state requirements, serving as the maintenance plan for the federal eight-hour ozone standard and as the state triennial update required by the Health and Safety Code to demonstrate how the District will expedite attainment of the state eight-hour ozone standard. The plan was

developed for Santa Barbara County as required by both the 1998 California Clean Air Act and the 1990 Federal Clean Air Act Amendments.

In March 2015 the District Board adopted the 2013 Clean Air Plan. The 2013 Plan provides a three-year update to the 2010 Clean Air Plan. As Santa Barbara County has yet to attain the state eight-hour ozone standard, the 2013 Clean Air Plan demonstrates how the District plans to attain that standard. The 2013 Clean Air Plan therefore satisfies all state triennial planning requirements.

7.3 Offset Requirements

The Barham Ranch stationary source exceeds the emission offset thresholds of Regulation VIII for NO_x and ROC emissions, however this stationary source did not become subject to the emission offset requirements of Regulation VIII until adoption of revised Rule 802 in August 2016, therefore Sierra Resources is not required to provide emission reduction credits for the emissions associated with this permit.

8.0 Lead Agency Permit Consistency

The Santa Barbara County Planning and Development Department is the lead agency for this project. To the District's knowledge, this permit is consistent with all provisions of the lead agency permit.

9.0 Permit Conditions

This section lists the applicable permit conditions for the Barham/Boyne Lease. Section A lists the standard administrative conditions. Section B lists 'generic' permit conditions, including emission standards, for all equipment in this permit. Section C lists conditions affecting specific equipment. Conditions listed in Sections A, B and C are enforceable by the USEPA, the District, the State of California and the public. Where any reference contained in Sections 9.A, 9.B or 9.C refers to any other part of this permit, that part of the permit referred to is federally-enforceable. In case of a discrepancy between the wording of a condition and the applicable federal or District rule(s), the wording of the rule shall control.

9.A Standard Administrative Conditions

The following federally-enforceable administrative permit conditions apply to the Barham/Boyne Lease:

A.1 **Condition Acceptance.** Acceptance of this operating permit by Sierra Resources shall be considered as acceptance of all terms, conditions, and limits of this permit. *[Re: ATC 8269, PTO 8269]*

A.2 **Grounds for Revocation.** Failure to abide by and faithfully comply with this permit or any Rule, Order, or Regulation may constitute grounds for revocation pursuant to California Health & Safety Code Section 42307 *et seq. [Re: ATC 8269, PTO 8269]*

A.3 **Access to Records and Facilities.** As to any condition that requires for its effective enforcement the inspection of records or facilities by the District or its agents, Sierra Resources shall make such records available or provide access to such facilities upon notice from the District. Access shall mean access consistent with California Health and Safety Code Section 41510 and Clean

Air Act Section 114A. *[Re: ATC 8837, PTO 8837]*

A.4 **Conflicts Between Conditions.** In the event that any condition herein is determined to be in conflict with any other condition contained herein, then, if principles of law do not provide to the contrary, the condition most protective of air quality and public health and safety shall prevail to the extent feasible. *[Re: ATC 8269, PTO 8269]*

A.5 **Compliance.** Nothing contained within this permit shall be construed to allow the violation of any local, State or Federal rule, regulation, ambient air quality standard or air quality increment. *[Re: ATC 8269, PTO 8269]*

A.6 **Consistency with Analysis.** Operation under this permit shall be conducted consistent with all data, specifications and assumptions included with the application and supplements thereof (as documented in the District's project file) and the District's analyses under which this permit is issued as documented in the Permit Analyses prepared for and issued with the permit. *[Re: ATC 8269, PTO 8269]*

A.7 **Compliance with Permit Conditions.**

(a) The permittee shall comply with all permit conditions in Sections 9.A, 9.B and 9.C.

(b) This permit does not convey property rights or exclusive privilege of any sort.

(c) Any permit noncompliance constitutes a violation of the Clean Air Act and is grounds for enforcement action; for permit termination, revocation and re-issuance, or modification; or for denial of a permit renewal application.

(d) It shall not be a defense for the permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

(e) A pending permit action or notification of anticipated noncompliance does not stay any permit condition.

(f) Within a reasonable time period, the permittee shall furnish any information requested by the Control Officer, in writing, for the purpose of determining:

(i) compliance with the permit, or
(ii) whether or not cause exists to modify, revoke and reissue, or terminate a permit or for an enforcement action.

(g) In the event that any condition herein is determined to be in conflict with any other condition contained herein, then, if principles of law do not provide to the contrary, the condition most protective of air quality and public health and safety shall prevail to the extent feasible. *[Re: 40 CFR Part 70.6, District Rules 1303.D.1]*

A.8 **Consistency with State and Local Permits.** Nothing in this permit shall relax any air pollution control requirement imposed on the Barham Ranch Stationary Source by the State of California or the California Coastal Commission in any consistency determination for this project with the

California Coastal Act.

A.9 **Emergency Provisions.** The permittee shall comply with the requirements of the District, Rule 505 (Upset/Breakdown rule) and/or District Rule 1303.F, whichever is applicable to the emergency situation. In order to maintain an affirmative defense under Rule 1303.F, the permittee shall provide the District, in writing, a "notice of emergency" within 2 working days of the emergency. The "notice of emergency" shall contain the information/documentation listed in Sections (1) through (5) of Rule 1303.F. *[Re: 40 CFR 70.6, District Rule 1303.F]*

A.10 **Compliance Plans.**

(a) The permittee shall comply with all federally enforceable requirements that become applicable during the permit term in a timely manner.

(b) For all applicable equipment, the permittee shall implement and comply with any specific compliance plan required under any federally-enforceable rules or standards. *[Re: District Rule 1302.D.2]*

A.11 **Right of Entry.** The Regional Administrator of USEPA, the Control Officer, or their authorized representatives, upon the presentation of credentials, shall be permitted to enter upon the premises where a Part 70 Source is located or where records must be kept:

(a) To inspect the stationary source, including monitoring and control equipment, work practices, operations, and emission-related activity;

(b) To inspect and duplicate, at reasonable times, records required by this Permit to Operate;

(c) To sample substances or monitor emissions from the source or assess other parameters to assure compliance with the permit or applicable requirements, at reasonable times. Monitoring of emissions can include source testing. *[Re: District Rule 1303.D.2]*

A.12 **Permit Life.** The Part 70 permit shall become invalid three years from the date of issuance unless a timely and complete renewal application is submitted to the District. Any operation of the source to which this Part 70 permit is issued beyond the expiration date of this Part 70 permit and without a valid Part 70 operating permit (or a complete Part 70 permit renewal application) shall be a violation of the CAAA, § 502(a) and 503(d) and of the District rules. The permittee shall apply for renewal of the Part 70 permit no later than 180 days before the permit expiration date. Upon submittal of a timely and complete renewal application, the Part 70 permit shall remain in effect until the Control Officer issues or denies the renewal application. *[Re: District Rule 1304.D.1]*

A.13 **Reimbursement of Costs.** All reasonable expenses, as defined in District Rule 210, incurred by the District, District contractors, and legal counsel for all activities that follow the issuance of this permit, including but not limited to permit condition implementation, compliance verification and emergency response, directly and necessarily related to enforcement of the permit shall be reimbursed by Sierra Resources as required by Rule 210. *[Re: District Rules 1303.D.1 and 1304.D.11, 40 CFR 70.6]*

A.14 **Prompt Reporting of Deviations.** The permittee shall submit a written report to the District documenting each and every deviation from the requirements of this permit or any applicable

federal requirements within 7-days after discovery of the violation, but not later than 180-days after the date of occurrence. The report shall clearly document 1) the probable cause and extent of the deviation, 2) equipment involved, 3) the quantity of excess pollutant emissions, if any, and 4) actions taken to correct the deviation. The requirements of this condition shall not apply to deviations reported to District in accordance with Rule 505. *Breakdown Conditions*, or Rule 1303.F *Emergency Provisions*. *[District Rule 1303.D.1, 40 CFR 70.6(a) (3)]*

A.15 **Reporting Requirements/Compliance Certification.** The permittee shall submit compliance certification reports to the USEPA and the Control Officer every six-months. A paper copy, as well as, a complete PDF electronic copy of these reports, shall be in a format approved by the District. These reports shall be submitted on District forms and shall identify each applicable requirement/condition of the permit, the compliance status with each requirement/condition, the monitoring methods used to determine compliance, whether the compliance was continuous or intermittent, and include detailed information on the occurrence and correction of any deviations (excluding emergency upsets) from permit requirement. The reporting periods shall be each half of the calendar year, e.g., January through June for the first half of the year. A paper copy, as well as, a complete PDF electronic copy of these reports, shall be submitted by September 1st and March 1st, respectively, each year. Supporting monitoring data shall be submitted in accordance with the "Semi-Annual Compliance Verification Report" condition in section 9.C. The permittee shall include a written statement from the responsible official, which certifies the truth, accuracy, and completeness of the reports. *[Re: District Rules 1303.D.1, 1302.D.3, 1303.2.c]*

A.16 **Federally-Enforceable Conditions.** Each federally-enforceable condition in this permit shall be enforceable by the USEPA and members of the public. None of the conditions in the District-only enforceable section of this permit are federally-enforceable or subject to the public/USEPA review. *[Re: CAAA, § 502(b)(6), 40 CFR 70.6]*

A.17 **Recordkeeping Requirements.** Records of required monitoring information shall include the following:

(a) The date, place as defined in the permit, and time of sampling or measurements

(b) The date(s) analyses were performed

(c) The company or entity that performed the analyses

(d) The analytical techniques or methods used

(e) The results of such analyses

(f) The operating conditions as existing at the time of sampling or measurement

The records (electronic or hard copy), as well as all supporting information including calibration and maintenance records, shall be maintained for a minimum of five (5) years from date of initial entry by Sierra Resources and shall be made available to the District upon request. *[Re: District Rule 1303.D.1.f, 40CFR70.6(a)(3)(ii)(A)]*

A.18 **Conditions for Permit Reopening.** The permit shall be reopened and revised for cause under any of the following circumstances:

(a) Additional Requirements: If additional applicable requirements (e.g., NSPS or MACT) become applicable to the source which has an unexpired permit term of three (3) or more years, the permit shall be reopened. Such a reopening shall be completed no later than 18 months after promulgation of the applicable requirement. However, no such reopening is

required if the effective date of the requirement is later than the date on which the permit is due to expire, unless the original permit or any of its terms and conditions has been extended. All such re-openings shall be initiated only after a 30-day notice of intent to reopen the permit has been provided to the permittee, except that a shorter notice may be given in case of an emergency.

(b) Inaccurate Permit Provisions: If the District or the USEPA determines that the permit contains a material mistake or that inaccurate statements were made in establishing the emission standards or other terms or conditions of the permit, the permit shall be reopened. Such re-openings shall be made as soon as practicable.

(c) Applicable Requirement: If the District or the USEPA determines that the permit must be revised or revoked to assure compliance with any applicable requirement including a federally-enforceable requirement, the permit shall be reopened. Such re-openings shall be made as soon as practicable.

Administrative procedures to reopen and revise/revoke/reissue a permit shall follow the same procedures as apply to initial permit issuance. Re-openings shall affect only those parts of the permit for which cause to reopen exists.

If a permit is reopened, the expiration date does not change. Thus, if the permit is reopened, and revised, then it will be reissued with the expiration date applicable to the re-opened permit. *[Re: 40 CFR 70.7, 40 CFR 70.6]*

A.19 **Emission Factor Revisions.** The District may update the emission factors for any calculation based on USEPA AP-42 or District P&P emission factors at the next permit modification or permit reevaluation to account for USEPA and/or District revisions to the underlying emission factors. Further, Sierra Resources shall modify its permit via an ATC application if compliance data shows that an emission factor used to develop the permit's potential to emit is lower than that documented in the field. The ATC permit shall, at a minimum, adjust the emission factor to that documented by the compliance data consistent with applicable rules, regulations and requirements. *[Re: ATC 8269, PTO 8269]*

9.B. Generic Conditions

The generic conditions listed below apply to all emission units, regardless of their category or emission rates. These conditions are federally enforceable. Compliance with these requirements is discussed in Section 3. In case of a discrepancy between the wording of a condition and the applicable federal or District rule(s), the wording of the rule shall control.

B.1 **Circumvention (Rule 301).** A person shall not build, erect, install, or use any article, machine, equipment or other contrivance, the use of which, without resulting in a reduction in the total release of air contaminants to the atmosphere, reduces or conceals an emission which would otherwise constitute a violation of Division 26 (Air Resources) of the Health and Safety Code of the State of California or of these Rules and Regulations. This Rule shall not apply to cases in which the only violation involved is of Section 41700 of the Health and Safety Code of the State of California, or of District Rule 303. *[Re: District Rule 301]*

B.2 **Visible Emissions (Rule 302).** Sierra Resources shall not discharge into the atmosphere from any single source of emission any air contaminants for a period or periods aggregating more than three minutes in any one hour that is:

(a) As dark or darker in shade as that designated as No. 1 on the Ringlemann Chart, as published by the United States Bureau of Mines, or

(b) Of such opacity as to obscure an observer's view to a degree equal to or greater than does smoke described in subsection B.2(a) above. *[Re: District Rule 302]*

(c) Sierra Resources shall determine compliance with the requirements of this Condition and Rule 302. *[Re: District Rule 302]*

B.3 **Nuisance (Rule 303).** No pollutant emissions from any source at Sierra Resources shall create nuisance conditions. Operations shall not endanger health, safety or comfort, nor shall they damage any property or business. *[Re: District Rule 303]*

B.4 **Specific Contaminants (Rule 309).** Sierra Resources shall not discharge into the atmosphere from any single source sulfur compounds and combustion contaminants (particulate matter) in excess of the applicable standards listed in Sections A through E of Rule 309. *[Re: District Rule 309]*

B.5 **Organic Solvents (Rule 317).** Sierra Resources shall comply with the emission standards listed in Rule 317.B. Compliance with this condition shall be based on Sierra Resource's compliance with Condition C.7 of this permit. *[Re: District Rule 317]*

B.6 **Metal Surface Coating Thinner and Reducer (Rule 322).** The use of photochemically reactive solvents as thinners or reducers in metal surface coatings is prohibited. Compliance with this condition shall be based on Sierra Resource's compliance with Condition C.7 of this permit and facility inspections. *[Re: District Rule 322]*

B.7 **Architectural Coatings (Rule 323.1).** Sierra Resources shall comply with the rule requirements for any architectural coating that is supplied, sold, offered for sale, or manufactured for use within the District. *[Re: District Rules 323, 317, 322, 324*

B.8 **Disposal and Evaporation of Solvents (Rule 324).** Sierra Resources shall not dispose through atmospheric evaporation of more than one and a half gallons of any photochemically reactive solvent per day. Compliance with this condition shall be based on Sierra Resource's compliance with Condition C.7 of this permit and facility inspections. *[Re: District Rule 324]*

B.9 **Adhesives and Sealants (Rule 353).** Sierra Resources shall not use adhesives, adhesive bonding primers, adhesive primers, sealants, sealant primers, or any other primers, unless the permittee complies with the following:

(a) Such materials used are purchased or supplied by the manufacturer or suppliers in containers of 16 fluid ounces or less; or alternately

(b) When Sierra Resources uses such materials from containers larger than 16 fluid ounces and the materials are not exempt by Rule 353.B.1, the total reactive organic compound emissions from the use of such material shall not exceed 200 pounds per year unless the

substances used and the operational methods comply with Sections D, E, F, G, and H of Rule 353. Compliance shall be demonstrated by recordkeeping in accordance with Section B.2 and/or Section O of Rule 353. *[Re: District Rule 353]*

B.10 **CARB Registered Portable Equipment.** State registered portable equipment shall comply with State registration requirements. A copy of the state registration shall be readily available whenever the equipment is at the facility. *[Re: District Rule 202]*

B.11 **Emergency Episode Plan (Rule 603).** During emergency episodes, Sierra Resources shall implement the Emergency Episode Plan approved on December 12, 2000.

9.C *Requirements and Equipment Specific Conditions*

This section contains non-generic federally-enforceable conditions, including emissions and operations limits, monitoring, recordkeeping, and reporting for each specific equipment group. This section may also contain other non-generic conditions.

C.1 **External Combustion Equipment.** The following equipment items are included in this emissions unit category:

Device #	Name and Description
005144	Heater Treater, field gas-fired: 1.370 MMBtu/hr heat input
110245	Boiler, field gas-fired: 3.500 MMBtu/hr heat input

(a) Emission Limits: Mass emissions from the equipment listed in this permit condition shall not exceed the emission limits listed in Tables 5.1-3 and 5.1-4. Compliance with these limits shall be assessed through compliance with the monitoring, recordkeeping, and reporting conditions listed in this permit.

(b) Operational Limits: The following additional operational limits apply:

(i) The heat input to the heater treater and boiler shall not exceed the following limits. These limits are based on the design rating of these units. Unless otherwise designated by the Control Officer, the following fuel heat content shall be used for determining compliance: Natural gas = 1,050 Btu/scf

	MMbtu/hr	MMbtu/day	MMBtu/yr
Heater Treater	1.370	32.880	12,001.000
Boiler	3.5000	84.000	30,660.000

(ii) Rule 361 Compliance - Existing Boiler: On or before January 30, 2019, the owner or operator of any existing unit shall apply for an Authority to Construct permit to replace or modify the unit to bring it into compliance with the Rule 361 emission standards. On or before January 1, 2020, the owner or operator of any unit shall demonstrate final compliance with Rule 361. Any existing unit that is replaced or modified is subject to requirements of Rule 361 and shall first obtain a District ATC permit prior to installation or modification.

(iii) The heater treater and boiler shall be fired on the field-gas produced at this lease. The concentration of sulfur compounds (calculated as H_2S at standard conditions, 60°F and 14.7 psia) in fuel burned in this unit shall not exceed 9.43 grains per 100 cubic feet (150 ppmvd).

(c) Monitoring: The following monitoring conditions apply:

(i) Sierra Resources shall submit for District approval a *Fuel Gas Monitoring Plan* within 60-days of the final issuance of this permit. This plan shall include all required meter specifications, manufacturer recommended calibration and maintenance procedures, recordkeeping and reporting requirements and procedures. The plan shall be implemented within 60-days of District plan approval.

(ii) The H_2S content of the fuel gas shall be measured on a quarterly basis using colorimetric gas detection tubes or a District-approved equivalent. If the tube measurement indicates an H_2S content greater than 120 ppm_v, the permittee shall measure the total sulfur content of the gaseous fuel within one week of the tube measurement in accordance with ASTM-D1072 or an District approved equivalent method.

The high heating value (HHV) of the fuel gas (Btu/scf) shall be measured annually in accordance with ASTM D-3588 or an District-approved method. Records shall be kept on site and made available for inspection by the District upon request.

(iii) The high heating value (HHV) of the fuel gas (Btu/scf) shall be measured annually in accordance with ASTM D-3588 or a District-approved method. Records shall be kept on site and made available for inspection by the District upon request.

(d) Recordkeeping: The following record keeping conditions apply to the external combustion equipment items listed above:

(i) The volume of gas combusted each month (scf) in each unit and the number of days that each unit operated.

(ii) The quarterly hydrogen sulfide measurements and total sulfur measurements of the fuel gas.

(iii) The high heating value of the fuel gas.

(e) Reporting: On a semi-annual basis, a report detailing the previous six month's activities shall be provided to the District. The report must list all data required by the *Semi-Annual Compliance Verification Reports* condition of this permit. (*Re: District Rule 1303, 40 CFR 70.6*)

C.2 **Storage Tanks.** The following equipment are included in this emissions category:

EQ Device No.	Name
TANKS	
110246	Crude Oil Storage Tank (Tank #87)
008492	Crude Oil Storage Tank (Tank #88)
003340	Crude Oil Storage Tank (Tank #89)
107889	Wash Tank
003341	Wastewater Tank

(a) Emission Limits: Mass emissions from the equipment listed in this permit condition shall not exceed the emission limits listed in Tables 5.1-3 and 5.1-4. Compliance with these limits shall be assessed through compliance with the monitoring, recordkeeping, and reporting conditions listed in this permit.

(b) Operational Limits: All process operations from the tanks listed in this section shall meet the requirements of District Rule 325, Sections D, E, F and G. Compliance shall be assessed through the monitoring, recordkeeping and reporting conditions in this permit and facility inspections. In addition, the following shall apply:

(i) *Tank Throughput Limits.* The following tank throughput limitation shall apply:

Oil Production [(a)]	2,000 barrels per day

[(a)] Throughputs calculated as monthly production divided by the number of producing days.

(ii) *Facility Throughput Limits*. The following tank throughput limits shall apply:

Oil Production [(a)]	2,000 barrels per day
Gas Production [(a)]	773,000 scf/day

[(a)]Throughputs calculated as monthly production divided by the number of producing days

(iii) *Vapor Recovery Unit*. Each tank shall be connected to a properly operating vapor recovery unit (VRU). The VRU shall be in operation when the equipment connected to the VRU system is in use. The VRU includes associated valves, fittings, and flanges. The VRU shall be maintained and operated to minimize the release of emissions from all systems connected to the VRU and shall meet the requirements of Rule 325.

(c) Monitoring: The permitted equipment is subject to the following monitoring requirements:

(i) The volume of crude oil tank throughput (bbls) and produced gas (scf) from this facility shall be measured by a calibrated meter or through use of a District-approved alternate method. The meter shall be calibrated according to manufacturer's specifications and the calibration records shall be made available to the District upon request.

(ii) On an annual basis the API gravity and true vapor pressure (TVP) shall be measured by using ASTM method D 323-82 (if the API gravity is equal to or greater than 20 degrees) or the HOST Method (if the API gravity is below 20 degrees). The true vapor pressure shall be based on the maximum expected temperature of the crude oil.

If ASTM D323-82 applies, the TVP shall be calculated from the Reid vapor pressure in accordance with API Bulletin 2518, or equivalent Reid/true vapor pressure correlation. The true vapor pressure shall be based on the maximum expected operating temperature of the storage tank. Sampling of crude oil for the vapor pressure measurement shall be completed per the *Crude Oil Sampling* condition of this permit.

(d) Recordkeeping: The following record keeping conditions apply:

(i) The volume of total crude oil throughput each month and the number of days that oil was produced.

(ii) The volume of gas produced each month (scf) and the number of days that gas was produced.

(iii) API gravity and TVP of the crude oil.

(e) Reporting: On a semi-annual basis, a report detailing the previous six month's activities shall be provided to the District. The report must list all data required by the *Semi-Annual Compliance Verification Reports* condition of this permit. (*Re: District Rule 1303, 40 CFR 70.6*)

C.3 **Production Flare.** The following equipment are included in this emissions unit category:

District Device ID #	Description
003344	17.500 MMBtu/hr equipped with an automatic ignition system.

(a) Emission Limits: Mass emissions from the flare shall not exceed the emission limits listed Tables 5.1-3 and 5.1-4 of this permit. Compliance with these limits shall be assessed through compliance with the monitoring, recordkeeping, and reporting conditions listed in this permit.

(b) Operational Limits: All process operations from the equipment listed in this section shall meet the requirements of District Rule 359. Compliance with these limits shall be assessed through compliance with the monitoring, recordkeeping and reporting conditions in this permit.

(i) The average daily and annual heat input limits to the flare shall not exceed the values listed below. These limits are based on the design rating of the flare and the values listed in the permit application. Unless otherwise designated by the Control Officer, the following fuel heat content shall be used for determining compliance: Natural gas = 1,050 Btu/scf.

Combustion Unit	MMBtu/hr	MMBtu/day	MMBtu/yr
Flare	17.500	420.000	153,300.000

(ii) The flare outlet shall be equipped with an automatic ignition system, a pilot-light and a pilot light gas source.

(iii) The flare shall operate in compliance with the applicable sections of Rule 359 at all times when combustible gases are vented to the flare and with the District-approved *Flare Gas Metering Plan*. Sierra Resources shall submit for District approval a *Flare Gas Metering Plan* within 60-days of the final issuance of this permit. The flare meter shall be installed and this plan shall be implemented within 60-days of plan approval. See condition 9C.3(c)(i) below for plan requirements.

(iv) Total sulfur content (calculated as H_2S at standard conditions, 60° F and 14.7 psia) of the gas flared shall not exceed 9.43 gr/100scf (150 ppmvd as H_2S at standard conditions).

(c) Monitoring: The following monitoring requirements shall apply:

(i) The production flare shall be equipped with dedicated District-approved electronic flow meter that will monitor and continuously record the daily and annual volume (scf) of produced gas (including pilot gas) combusted in the unit. The fuel meter shall be non-resettable, totalizing, and temperature and pressure corrected. The fuel meter shall be accurate to within five percent (5%) of the full scale reading. The fuel meter shall be calibrated at least every 12 months in accordance with the fuel meter manufacturer's recommendations and written procedures.

(ii) The presence of the flame in the flare pilot shall be continuously monitored using a thermocouple or an equivalent device that detects the presence of a flame.

(iii) The H_2S content of the flare gas shall be measured on a quarterly basis using colorimetric gas detection tubes or a District-approved equivalent. If a quarterly measurement indicates an H_2S content greater than 120 ppm_v, the permittee shall measure the total sulfur content of the gaseous fuel within one week of the quarterly measurement in accordance with ASTM-D1072 or a District approved equivalent method.

(d) Recordkeeping: The following recordkeeping conditions shall apply:

(i) The volume of gas combusted in the flare (scf) each month and the number of days that the flare operated.

(ii) The monthly measured hydrogen sulfide content and the annually measured total sulfur content, in units of ppmvd, of the flare gas.

(iii) All records required by the Flare Gas Metering Plan.

(e) Reporting: On a semi-annual basis, a report detailing the previous six month's activities shall be provided to the District. The report must list all data required by the *Semi-Annual Compliance Verification Reports* condition of this permit. *[Re: District Rule 1303, 40 CFR 70.6].*

C.4 **Fugitive Hydrocarbon Emissions Components.** The following equipment are included in this emissions unit category:

District Device No.	Equipment
003366	Component Leak-Paths in Hydrocarbon Service

(a) Emission Limits: Mass emissions from fugitive components shall not exceed the emission limits listed Tables 5.1-3 and 5.1-4 of this permit. Compliance with these limits shall be assessed through compliance with the monitoring, recordkeeping, and reporting conditions listed in this permit.

(b) Operational Limits: Operation of the equipment listed in this section shall conform to the requirements listed in District Rule 331.D and E. Compliance with these limits shall be assessed through compliance with the monitoring, recordkeeping and reporting conditions in this permit. In addition, Sierra Resources shall meet the following requirements:

(i) *VRS Use.* The vapor recovery/gas collection (VRGC) system shall be in operation when the equipment connected to the VRGC system at the facility is in use. The VRGC system includes piping, valves, and flanges associated with the VRGC system. The VRGC system shall be maintained and operated to minimize the release of emissions from all systems, including pressure relief valves and gauge hatches.

(ii) *I&M Program.* The District-approved I&M Plan for this lease shall be implemented for the life of the project. The Plan, and any subsequent District approved revisions, is incorporated by reference as an enforceable part of this permit. An updated Fugitive Emissions Inspection and Maintenance Plan must be submitted to the District for review and approval within one calendar quarter whenever there is a change in the component list or diagrams.

(iii) *Venting.* All routine venting of hydrocarbons shall be routed to either a sales compressor, flare header, injection well or other District-approved control device.

(c) Monitoring. The equipment listed in this section are subject to all the monitoring requirements listed in District Rule 331.F. The test methods in Rule 331.H shall be used, when applicable.

(d) Recordkeeping. All inspection and repair records shall be retained at the source for a minimum of five years. The equipment listed in this section are subject to all the recordkeeping requirements listed in District Rule 331.G.

(e) Reporting. On a semi-annual basis, a report detailing the previous six-month's activities shall be provided to the District. The report must list all data required by the *Semi-Annual Compliance Verification Reports* condition of this permit. *[Re: ATC 8837, District Rules 331 and 1303, 40 CFR 70.6]*

C.5 **Well Cellars.** The following equipment are included in this emissions category:

Device No.	Equipment Name
006335	Well Cellars (633 sq. ft.)

(a) Emission Limits. Mass emissions from well cellars shall not exceed the emission limits listed Tables 5.1-3 and 5.1-4 of this permit. Compliance with these limits shall be assessed through compliance with the monitoring, recordkeeping, and reporting conditions listed in this permit.

(b) Operational Limits. All process operations from the equipment listed in this section shall meet the requirements of District Rule 344, including the following:

(i) A person shall not open any valve at the wellhead without using a portable container to catch and contain any organic liquid that would otherwise drop on the ground or into the well cellar. Such container shall be kept closed when not in use.

(ii) Immediately before a well is steamed or after a well head is steam cleaned, the well cellar in which it is located shall be pumped out.

(iii) Neither of the following conditions shall occur unless the owner or operator discovered the condition and the well cellar is pumped within 7-days of discovery:

(a) liquid depth exceeding 50-percent of the depth of the well cellar.

(b) oil/petroleum depth exceeding 2-inches.

If a well cellar cannot be accessed by a vacuum truck due to muddy conditions, the well cellar shall be pumped as soon as it becomes accessible.

(c) Monitoring. Sierra Resources shall inspect the well cellars on a weekly basis to ensure that the liquid depth and the oil/petroleum depth does not exceed the limits in Rule 344.D.3.c.

(d) Recordkeeping. The following information relating to detection of conditions requiring pumping of a well cellar as required in Section D.3.c shall be recorded for each detection:

(i) the date of the detection.

(ii) the name of the person and company performing the test or inspection.

(iii) the date and time the well cellar is pumped.

(e) Reporting. On a semi-annual basis, a report detailing the previous six-month's activities shall be provided to the District. The report must list all data required by the *Semi-Annual Compliance Verification Reports* condition of this permit.

C.6 **Crude Oil Loading Rack.** The following equipment are included in this emissions category:

District Device No.	Equipment Name
003342	Crude Oil Loading Rack

(a) Emission Limits: Mass emissions from the loading rack shall not exceed the emission limits listed Tables 5.1-3 and 5.1-4 of this permit. Compliance with these limits shall be assessed through compliance with the monitoring, recordkeeping, and reporting conditions listed in this permit.

(a) Operational Restrictions: The following operational restrictions shall apply:

(i) The following throughput limitations shall not be exceeded:

Truck Loading of Oil	160	bbl/hour
Truck Loading of Oil	320	bbl/day
Truck Loading of Oil	365,000	bbl/year

(ii) The loading rack used to ship oil from the facility shall use bottom-loading and a vapor recovery system that prevents the vapors displaced during loading from being released into the atmosphere. The operator shall also use either a block and bleed

valve system or other connectors with equivalent spill prevention characteristics. Additionally the operator shall use one of the following devices to prevent overfill:

a. A primary overfill protection system consisting of a preset fill meter with automatic flow shutoff and a secondary overfill protection system consisting of a liquid level sensor with the ability to signal high level to activate a control valve to shut off flow, or

b. A combination of overfill devices and/or procedures, submitted in writing to the Control Officer, that is at least as effective in preventing overfill spillage as the system in Condition C.4.b(ii)a District written approval must be obtained prior to implementing this option.

(c) Monitoring: The volumes of oil (bbls) shipped from this facility shall be measured through the use of calibrated meters or through the use of an District-approved alternate method. The meters shall be calibrated according to manufacturer's specifications and the calibration records shall be made available to the District upon request.

(d) Recordkeeping: The following records shall be maintained:

(i) The dates of oil shipments from the loading rack and the total volume of oil (bbls) shipped on each day listed.

(e) Reporting: On a semi-annual basis, a report detailing the previous six-month's activities shall be provided to the District. The report must list all data required by the *Semi-Annual Compliance Verification Reports* condition of this permit.

C.7 **Solvent Usage.** The following items are included in this emissions unit category: Photochemically reactive solvents, surface coatings and general solvents.

(a) Emission Limits. The following solvent emission limits are federally-enforceable for the entire stationary source:

Solvent Type	lbs/hour	lbs/day
Photochemically Reactive	8 lbs/hour	40 lbs/day
Non-Photochemically Reactive	450 lbs/hour	3,000 lbs/day

(b) Operational Limits. n/a.
(c) Monitoring. n/a
(d) Recordkeeping/Reporting. n/a.

C.8 **Recordkeeping.** Sierra Resources shall maintain all records and logs required by this permit or any applicable federal rule or regulation for a minimum of five calendar years from the date of information collection and log entry at the lease. These records or logs shall be readily accessible and be made available to the District upon request.
[Re: 40 CFR 70.6, District Rule 1303]

C.9 **Requirements for Produced Gas.** The emissions of produced gas shall be controlled at all times using a properly maintained and operated system that directs all produced gas, except gas used in a

tank battery vapor recovery system, to one of the following: (a) a system handling gas for fuel, sale, or underground injection; or (b) a flare that combusts reactive organic compounds; or (c) a device with an ROC vapor removal efficiency of at least 90-percent by weight. The provisions of this condition shall not apply to wells which are undergoing routine maintenance. *[Re: District Rule 325]*

C.10 **Crude Oil Sampling.** Samples of crude oil shall be obtained from the initial tank, or from an active flow line into the tank, provided that there is an active flow of crude oil into the tank. Samples shall be taken from other tanks if requested in writing by the District.

C.11 **Semi-Annual Monitoring/Compliance Verification Reports.** Sierra Resources shall submit a report to the District every six-months to verify compliance with the emission limits and other requirements of this permit. The reporting periods shall be each half of the calendar year, e.g., January through June for the first half of the year. A paper copy, as well as, a complete PDF electronic copy of these reports, shall be submitted by September 1st and March 1st, respectively, each year, and shall be in a format approved by the District. All logs and other basic source data not included in the report shall be available to the District upon request. The second report shall also include an annual report for the prior four quarters. The report shall include the following information:

(a) Heater Treater and Boiler

(i) The volume of gas combusted each month (scf) in each unit and the number of days that each unit operated.

(ii) The quarterly hydrogen sulfide measurements and total sulfur measurements of the fuel gas.

(iii) The high heating value of the fuel gas

(b) Storage Tanks

(i) The volume of oil produced each month and the number of days that oil was produced.

(ii) The volume of gas produced each month (scf) and the number of days that gas was produced.

(iii) API gravity and TVP of the crude oil.

(c) Production Flare

(i) The volume of gas combusted in the flare (scf) each month and the number of days the flare operated each month.

(ii) The monthly measured hydrogen sulfide content and the annually measured total sulfur content, in units of ppmvd, of the flare gas.

(iii) Flare meter calibration and maintenance records.

(d) Rule 331 fugitive hydrocarbon I&M program data:

- inspection summary.
- record of leaking components.
- record of leaks from critical components.
- record of leaks from components that incur five repair actions within a continuous 12-month period.
- record of component repair actions including dates of component re-inspections.

(e) Loading Rack

The dates of oil shipments from the loading rack and the total volume of oil (bbls) shipped on each day listed.

(f) Solvents

On a monthly basis the amount of surface coating/solvent used field-wide in the Lompoc Oilfield; the percentage of ROC by weight (as applied); the surface coating/solvent density; the amount of solvent reclaimed; whether the surface coating/solvent is photochemically reactive; and, the resulting emissions of ROC and photochemically reactive surface coatings/solvents to the atmosphere in units of pounds per month.

C.12 **Documents Incorporated by Reference.** The documents listed below and any District approved updates thereof, are incorporated herein and shall have the full force and effect of a permit condition of this permit. These documents shall be implemented for the life of the project and shall be made available to District inspection staff upon request.

- *Fugitive Hydrocarbon Inspection and Maintenance Plan (July 2017)*
- *Flare Metering Plan (to be submitted within 45 days of final permit issuance)*
- *Fuel Gas Use Plan (to be submitted within 45 days of final permit issuance)*

C.13 **External Combustion Units - Permits Required.**

(1) An ATC/PTO permit shall be obtained prior to installation of any grouping of Rule 360 applicable boilers or hot water heaters whose combined system design heat input rating exceeds 2.000 MMBtu/hr.

(2) An ATC permit shall be obtained prior to installation, replacement, or modification of any existing Rule 361 applicable boiler or water heater rated over 2.000 MMBtu/hr. An ATC shall be obtained for any size boiler or water heater if the unit is not fired on natural gas or propane.

C.14 **Compliance with Rule 346.** Equipment shall not be used to transfer organic liquids into any organic liquid cargo vessel unless the equipment is in full compliance with District Rule 346.

C.15 **Compliance with Rule 359.** The permittee shall comply with the applicable requirements of District Rule 359: *Flares and Thermal Oxidizers* for each flare subject to this permit.

9.D District-Only Conditions

The following section lists permit conditions that are not federally-enforceable (i.e., not enforceable by the USEPA or the public). However, these conditions are enforceable by the District and the State of California. These conditions have been determined as being necessary to ensure that operation of the facility complies with all applicable local and state air quality rules, regulations and laws. Failure to comply with any of these conditions shall be a violation of District Rule 206, this permit, as well as any applicable section of the California Health & Safety Code.

D.1 **Solvent Usage.** The following condition shall apply:

(a) Emission Limits. Mass emissions from the tank heater shall not exceed the emission limits listed in Tables 5.1-3 and 5.1-4. Compliance with this condition shall be based on the monitoring, recordkeeping and reporting conditions in this permit.

(b) Operational Limits: Use of solvents for cleaning/degreasing shall conform to the requirements of District Rules 317, 322, 323 and 324. Compliance with these rules shall be assessed through compliance with the monitoring, recordkeeping and reporting conditions in this permit and facility inspections.

(i) *Containers.* Vessels or containers used for storing materials containing organic solvents shall be kept closed unless adding to or removing material from the vessel or container.

(ii) *Materials.* All materials that have been soaked with cleanup solvents shall be stored, when not in use, in closed containers that are equipped with tight seals.

(iii) *Solvent Leaks.* Solvent leaks shall be minimized to the maximum extent feasible or the solvent shall be removed to a sealed container and the equipment taken out of service until repaired. A solvent leak is defined as either the flow of three liquid drops per minute or a discernible continuous flow of solvent.

(iv) *Reclamation Plan.* Sierra Resources may submit a Plan to the District for the disposal of any reclaimed solvent. If the Plan is approved by the District, all solvent disposed of pursuant to the Plan will not be assumed to have evaporated as emissions into the air and, therefore, will not be counted as emissions from the source. Sierra Resources shall obtain District approval of the procedures used for such a disposal Plan. The Plan shall detail all procedures used for collecting, storing and transporting the reclaimed solvent. Further, the ultimate fate of these reclaimed solvents must be stated in the Plan.

(c) Monitoring. n/a.

(d) Recordkeeping. Sierra Resources shall record in a log the following on a monthly basis for each solvent used: amount used; the percentage of ROC by weight (as applied); the solvent density; the amount of solvent reclaimed for District-approved disposal; whether the solvent is photochemically reactive; and, the resulting emissions to the atmosphere in units

of pounds per month and pounds per day. Product sheets (MSDS or equivalent) detailing the constituents of all solvents shall be maintained in a manner readily accessible to District inspection.

(e) Reporting. On a semi-annual basis, a report detailing the previous six-month's activities shall be provided to the District. The report must list all data required by the *Semi-Annual Compliance Verification Reports* condition of this permit. *[Re: 40 CFR 70.6, District Rules 317, 322,323, 324]*

D.2 **Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities.** The equipment permitted herein shall be operated in compliance with the California Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities regulation (CCR Title 17, Section 95665 *et. Seq.*).

D.3 **CARB GHG Regulation Recordkeeping.** The permittee shall maintain at least 5 years of records that document the following:

i. The number of crude oil or natural gas wells at the facility.

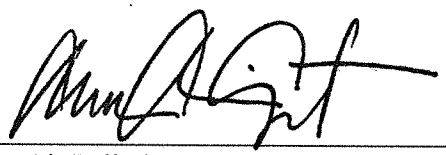
ii. A list identifying all pressure vessels, tanks, separators, sumps, and ponds at the facility, including the size of each tank and separator in units of barrels.

iii. The annual crude oil, natural gas, and produced water throughput of the facility.

iv. A list identifying all reciprocating and centrifugal natural gas compressors at the facility.

v. A count of all natural gas powered pneumatic devices and pumps at the facility.

A copy of the *Best Practices Management Plan* designed to limit methane emissions from circulation tanks, if applicable.



Air Pollution Control Officer

AUG 31 2018

Date

NOTES:

(a) This permit supersedes all previous District PTO permits issued for the Barham/Boyne Lease

(b) Permit Reevaluation Due Date: August 2021

\\sbcapcd.org\shares\Groups\ENGR\WP\Oil&Gas\Major Sources\SSID 04632 Pt. Pedernales-Lompoc Oil Fields\FID 03069 Barham/Boyne Lease\Reevals\PT70 7126 R7\Final PTO 7126-R7 12-17-15.doc

10.0 Attachments

10.1 Emission Calculation Documentation

10.2 Emission Calculation Spreadsheets

10.3 IDS Database Emission Tables

10.4 Equipment List

10.5 Well List

10.6 Insignificant Activities

10.7 Fee Statement

10.8 Comments on Draft Permit/District Responses

10.1 Emission Calculation Documentation
Sierra Resources Barham/Boyne Lease

This attachment contains all relevant emission calculation documentation used for the emission tables in Section 5. Refer to Section 4 for the general equations. Detailed calculation spreadsheets are attached as Attachment 10.2.

Reference A - External Combustion Equipment

- The maximum operating schedule is in units of hours
- All heat input ratings based on burner nameplate and manufacturer data (HHV based)
- All emission calculations based on heat input rating (HHV based)
- PM_{10} to PM ratio = 1.0 (ref: USEPA AP-42, Table 1.4-1)
- The emission factors for all the pollutants (except SO2) are based on USEPA AP-42, Section 1.4, Fifth Edition, November 1995.
  Emission factors for SO_2 are based on mass balance:
  SO_x (as SO_2) = (0.169) × (ppmv S) ÷ (HHV) [units = lb/MMBtu]
- Emission calculations are based upon operations at maximum load.

Reference B - Petroleum Storage Tanks

- The hourly/daily/annual emissions for the petroleum storage tanks is based on USEPA AP-42 Chapter 7, Liquid Storage Tanks (5^{th} Edition, 2/96)

Reference C - Wastewater Tanks

- The maximum operating schedule is in units of hours
- Emission calculation methodology based on the CARB/KVB report *Emission Characteristics of Crude Oil Production Operations in California (1/83)*
- Calculations are based on surface area of emissions noted in the inspector's report
- The THC Speciation is based on CARB profiles # 529, 530, 531, 532; the ROC/TOC ratio is based on the District's guideline *"VOC/ROC Emission Factors and Reactivities for Common Source Types"* Table dated 07/13/98 (version 1.1).

Reference D - Components Emitting Fugitive ROCs

- Emission factors for clps associated with PTO 14856 are based on the *District P&P 6100.061* guidelines. Emissions from all other clps are included in the CARB/KVB report *Emission Characteristics of Crude Oil Production Operations in California (1/83)* emissions calculation spreadsheet. *(See Reference C above)*
- An 80% reduction in fugitive emissions was assumed due to the implementation of a fugitive inspection and maintenance plan pursuant to Rule 331.

Reference E - Production Flare

- NO_x and CO emission factors based on USEPA AP-42, Table 11.5-1 (9/91)
- ROC emission factor based on the District 2016 Flare Study
- PM emission factor based on District Flare Study - Phase I Report, Table 3.1.1 (7/91)
- SO_x emissions based on mass balance

$$SO_x \text{ (as } SO_2) = (0.169) \times (\text{ppmv S}) / (\text{HHV})$$

Reference F - Loading Rack

- Calculations based on District Loading Rack Emission Calculation Spreadsheet (ver3.0).

Reference G - Solvents

- All solvents not used to thin surface coatings are included in this equipment category
- Annual emission rates per pt70 permit application
- Daily and hourly emissions based on the Rule 317

Reference H - Greenhouse Gases

- GHG emissions from combustion sources are calculated using emission factors found in Tables C-1 and C-2 of 40 CFR Part 98 and global warming potentials found in Table A-1 of 40 CFR Part 98. CO2 equivalent emission factors are calculated for CO2, CH4, and N2O individually then summed to calculate a total CO2e emission factor. Annual CO2e emission totals are presented in short tons.

For natural gas combustion the emission factor is:
(53.06 kg CO2/MMbtu) (2.2046 lb/kg) = 116.97 lb CO2/MMBtu
(0.001 kg CH4/MMBtu) (2.2046 lb/kg)(25 lb CO2e/lb CH4) = 0.055 lb CO2e/MMBtu
(0.0001 kg N2O/MMBtu) (2.2046 lb/kg)(298 lb CO2e/lb N2O) = 0.066 lb CO2e/MMBtu
Total CO2e/MMBtu = 116.89 + 0.046 + 0.068 = 117.10 lb CO2e/MMBtu

10.2 Emission Calculation Spreadsheets

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

Basic Input Data	
liquid (1:G13, 2:G10, 3:G7, 4:C, 5:JP, 6:ker, 7:O2, 8:O6) =	4
liquid TVP =	2.7
if TVP is entered, enter TVP temperature (°F) =	99
tank heated (yes, no) =	no
if tank is heated, enter temp (°F) =	
vapor recovery system present? (yes, no) =	yes
is this a wash tank? (yes, no) =	no
will flashing losses occur in this tank? (yes, no) =	no
breather vent pressure setting range (psi) (def = 0.06):	0.06

Attachment: A-1
Permit: Pt70 PTO 15001
Date: 08/03/17
Tank: Crude Tank
Name: Barham/Boyne Lease
Filename:
District: Santa Barbara
Version: Tank-2b.xls

PRINT

Tank Data		
diameter (feet) =		21.14
capacity (enter barrels in first col, gals will compute) =	1,500	63,000
conical or dome roof? (c, d) =		c
shell height (feet) =		16
roof height (def = 1):		1
ave liq height (feet):		8
color (1:Spec Al, 2:Diff Al, 3:Lite, 4:Med, 5:Rd, 6:Wh) =		4
condition (1: Good, 2: Poor) =		1
upstream pressure (psig) (def = 0 when no flashing occurs):		0

Liquid Data	A	B
maximum daily throughput (bopd) =		2,000
Ann thruput (gal): (enter value in Column A if not max PTE)		3.066E+07
RVP (psia):		2.6176
°API gravity =		20

Computed Values		
roof outage [1] (feet):		0.3
vapor space volume [2] (cubic feet):		2,913
turnovers [3]:		486.67
turnover factor [4]:		0.23
paint factor [5]:		0.68
surface temperatures (°R, °F)		
average [6]:	527.2	67.2
maximum [7]:	539	79
minimum [8]:	515.4	55.4
product factor [9]:		0.75
diurnal vapor ranges		
temperature [10] (fahrenheit degrees):		47.2
vapor pressure [11] (psia):		0.723722
molecular weight [12] (lb/lb-mol):		50
TVP [13] (psia) [adjusted for ave liquid surface temp]:		1.39936
vapor density [14] (lb/cubic foot):		0.012368
vapor expansion factor [15]:		0.139
vapor saturation factor [16]:		0.618973
vented vapor volume (scf/bbl):		8
fraction ROG - flashing losses:		0.308
fraction ROG - evaporative losses:		0.885

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

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

Adjusted TVP Matrix	
liquid	TVP value
gas rvp 13	7.908
gas rvp 10	5.56
gas rvp 7	3.932
crude oil	1.39936
JP-4	1.516
jet kerosene	0.0103
fuel oil 2	0.009488
fuel oil 6	0.0000472

RVP Matrix	
liquid	RVP value
gas rvp 13	13
gas rvp 10	10
gas rvp 7	7
crude oil	2.617604
JP-4	2.7
jet kerosene	0.029
fuel oil 2	0.022
fuel oil 6	0.00019

Long-Term
VRU_Eff = 95.00%

Short-Term
VRU_Eff = 95.00%

Emissions	Uncontrolled ROC emissions			Controlled ROC emissions		
	lb/hr	lb/day	ton/year	lb/hr	lb/day	ton/year
breathing loss [17] =	0.11	2.74	0.50	0.01	0.14	0.03
working loss [18] =	0.89	21.36	3.90	0.04	1.07	0.19
flashing loss [19] =	0.00	0.00	0.00	0.00	0.00	0.00
TOTALS =	**1.00**	**24.11**	**4.40**	**0.05**	**1.21**	**0.22**

NOTES: see attachment for explanation of notes (1 through 19)

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

Basic Input Data	
liquid {1:G13, 2:G10, 3:G7, 4:C, 5:JP, 6:ker, 7:O2, 8:O6} =	4
liquid TVP =	2.7
if TVP is entered, enter TVP temperature (°F) =	99
tank heated {yes, no} =	no
if tank is heated, enter temp (°F) =	
vapor recovery system present? {yes, no} =	yes
is this a wash tank? {yes, no} =	Yes
will flashing losses occur in this tank? {yes, no} =	yes
breather vent pressure setting range (psi) {def = 0.06}:	0.06

Attachment: A-2
Permit: Pt70 PTO 15001
Date: 08/03/17
Tank: Wash Tank
Name: Barham/Boyne Lease
Filename:
District: Santa Barbara
Version: Tank-2b.xls

PRINT

Tank Data		
diameter (feet) =		21.14
capacity (enter barrels in first col, gals will compute) =	1,500	63,000
conical or dome roof? {c, d} =		c
shell height (feet) =		24
roof height {def = 1}:		1
ave liq height (feet):		23
color {1:Spec Al, 2:Diff Al, 3:Lite, 4:Med, 5:Rd, 6:Wh} =		4
condition {1: Good, 2: Poor} =		1
upstream pressure (psig) {def = 0 when no flashing occurs}:		0

Liquid Data	A	B
maximum daily throughput (bopd) =		2,000
Ann thruput (gal): (enter value in Column A if not max PTE)		3.066E+07
RVP (psia):		2.6176
°API gravity =		20

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

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

Computed Values		
roof outage [1] (feet):		0.3
vapor space volume [2] (cubic feet):		456
turnovers [3]:		486.67
turnover factor [4]:		0.23
paint factor [5]:		0.68
surface temperatures (°R, °F)		
average [6]:	527.2	67.2
maximum [7]:	539	79
minimum [8]:	515.4	55.4
product factor [9]:		0.75
diurnal vapor ranges		
temperature [10] (fahrenheit degrees):		47.2
vapor pressure [11] (psia):		0.723722
molecular weight [12] (lb/lb-mol):		50
TVP [13] (psia) {adjusted for ave liquid surface temp}:		1.39936
vapor density [14] (lb/cubic foot):		0.012368
vapor expansion factor [15]:		0.139
vapor saturation factor [16]:		0.912063
vented vapor volume (scf/bbl):		8
fraction ROG - flashing losses:		0.308
fraction ROG - evaporative losses:		0.885

Adjusted TVP Matrix	
liquid	TVP value
gas rvp 13	7.908
gas rvp 10	5.56
gas rvp 7	3.932
crude oil	1.39936
JP-4	1.516
jet kerosene	0.0103
fuel oil 2	0.009488
fuel oil 6	0.0000472

RVP Matrix	
liquid	RVP value
gas rvp 13	13
gas rvp 10	10
gas rvp 7	7
crude oil	2.617604
JP-4	2.7
jet kerosene	0.029
fuel oil 2	0.022
fuel oil 6	0.00019

Long-Term VRU_Eff = 95.00%

Short-Term VRU_Eff = 95.00%

Emissions	Uncontrolled ROC emissions			Controlled ROC emissions		
	lb/hr	lb/day	ton/year	lb/hr	lb/day	ton/year
breathing loss [17] =	0.03	0.63	0.12	0.00	0.03	0.01
working loss [18] =	0.00	0.00	0.00	0.00	0.00	0.00
flashing loss [19] =	0.00	0.00	0.00	0.00	0.00	0.00
TOTALS =	**0.03**	**0.63**	**0.12**	**0.00**	**0.03**	**0.01**

NOTES: see attachment for explanation of notes (1 through 19)

Attachment: A-3

Date: *08/03/17*

BOILER / STEAM GENERATOR CALCULATION WORKSHEET (ver. 6.0)

DATA

Permit No.	8869	
Owner/Operator	Purisima Hills	
Facility/Lease	Boyne	
Boiler Type	Firetube	
Boiler Mfg.	Rite Engineering	
Boiler Model No.	350WG	
Boiler Serial/ID No.	07-30178	
Boiler Horsepower	no data	Bhp
Burner Type	Gas	
Burner Mfg.	Power Flame	
Burner Model No.	LNICR3-G-25B	
Max. Firing Rate of Burner	3.500	MMBtu/hr
Max. Annual Heat Input	30,660.000	MMBtu/yr
Daily Operating schedule	24	hrs/day
Yearly Load factor (%)	100.00	%
Fuel Type	Field Gas	
High Heating Value	1,050	Btu/scf
Sulfur Content of Fuel	200.00	ppmvd as H2S
Nitrogen Content of Fuel	-	wt. % N
Boiler Classification	Commercial	
Firing Type	Other Type	
PM Emission Factor	0.0075	lb/MMBtu
PM_{10} Emission Factor	0.0075	lb/MMBtu
NO_x Emission Factor	0.0980	lb/MMBtu
SO_x Emission Factor	0.0342	lb/MMBtu
CO Emission Factor	0.0824	lb/MMBtu
ROC Emission Factor	0.0054	lb/MMBtu

RESULTS

	lb/hr	lb/day	TPY
Nitrogen Oxides (as NO_2)	0.34	8.23	1.50
Sulfur Oxides (as SO_2)	0.12	2.87	0.52
PM_{10}	0.03	0.63	0.11
Total Suspended Particulate (PM)	0.03	0.63	0.11
Carbon Monoxide	0.29	6.92	1.26
Reactive Organic Compounds (ROC)	0.02	0.45	0.08

Hourly Heat Release	3.500	MMBtu/hr
Daily Heat Release	84.000	MMBtu/day
Annual Heat Release	30,660.000	MMBtu/yr
Rule 342 Applicability	30.7	Billion Btu/yr

Attachment: A-4

Date: *08/03/17*

BOILER / STEAM GENERATOR CALCULATION WORKSHEET (ver. 6.0)

DATA

Permit No.	8869	
Owner/Operator	Purisima Hills	
Facility/Lease	Boyne	
Boiler Type	Firetube	
Boiler Mfg.	National Tank Company	
Boiler Model No.	B7513	
Boiler Serial/ID No.	N/A	
Boiler Horsepower	no data	Bhp
Burner Type	Gas	
Burner Mfg.	no data	
Burner Model No.	no data	
Max. Firing Rate of Burner	1.370	MMBtu/hr
Max. Annual Heat Input	12,001.200	MMBtu/yr
Daily Operating schedule	24	hrs/day
Yearly Load factor (%)	100.00	%
Fuel Type	Field Gas	
High Heating Value	1,050	Btu/scf
Sulfur Content of Fuel	200.00	ppmvd as H2S
Nitrogen Content of Fuel	-	wt. % N
Boiler Classification	Commercial	
Firing Type	Other Type	
PM Emission Factor	0.0075	lb/MMBtu
PM_{10} Emission Factor	0.0075	lb/MMBtu
NO_x Emission Factor	0.0980	lb/MMBtu
SO_x Emission Factor	0.0342	lb/MMBtu
CO Emission Factor	0.0824	lb/MMBtu
ROC Emission Factor	0.0054	lb/MMBtu

RESULTS

	lb/hr	lb/day	TPY
Nitrogen Oxides (as NO_2)	0.13	3.22	0.59
Sulfur Oxides (as SO_2)	0.05	1.12	0.21
PM_{10}	0.01	0.25	0.05
Total Suspended Particulate (PM)	0.01	0.25	0.05
Carbon Monoxide	0.11	2.71	0.49
Reactive Organic Compounds (ROC)	0.01	0.18	0.03

Hourly Heat Release	1.370	MMBtu/hr
Daily Heat Release	32.880	MMBtu/day
Annual Heat Release	12,001.200	MMBtu/yr
Rule 342 Applicability	12.0	Billion Btu/yr

LOADING RACK EMISSION CALCULATION

Attachment:	A-5
Company:	Purisima Hills
Facility:	Barham/Boyne Lease
File Name:	

Reference: Loading Rack

Rack Type: Enter X as Appropriate		S Factor
Submerged loading of a clean cargo tank		0.50
Submerged loading: Dedicated normal service	X	0.60
Submerged loading: Dedicated vapor balance service		1.00
Splash loading of a clean cargo tank		1.45
Splash loading: Dedicated normal service		1.45
Splash loading: Dedicated vapor balance service		1.00

Input data			Reference
S = Saturation Factor	0.60	See AP-42 Table 4.4-1	2
M = Molecular Weight	50	Crude Oil: Default = 50 lb/lb-mole	3
P = True Vapor Pressure (psia)	2.700	See AP-42 Table 12.3-5	1
T = Liquid Temperature °R	559	99 °F + 460 = °R	5
R = Loading Rate (bbl/hr)	160.00	6,720 gallons (42 gallons = 1 bbl)	1
C = Storage Capacity (bbl)	320	13,440 gallons (42 gallons = 1 bbl)	1
A = Annual Production (bbl)	365,000	15,330,000 gallons (42 gallons = 1 bbl)	1
eff = Vapor Recovery Efficiency	0.95	Default = 0.95	1
ROC/THC = Reactivity	0.885	Crude Oil: Default = 0.885	

HLPD = hours loading per day = (C/R) if < 24 =	2.00	hours/day
HLPY = hours loading per year = (A/R) =	2281.25	hours/year
L_L = Loading loss (lb/1000 gal) = 12.46 (S)(P)(M)/T =	1.8055	lb/1000 gal

Total Uncontrolled Hydrocarbon Losses:

Hourly

$THL_H = (THL_A/HLPY) =$ **10.74** lbs/hr

Daily

$THL_D = (THL_H)(HLPD) =$ **21.48** lbs/day

Annual

$THL_A = (L_L)(A)(42\ gal/bbl)(1\ ton/2,000\ lbs)(ROC/THC) =$ **12.25** TPY

Total Controlled Hydrocarbon Losses:

Hourly

$THL_H = (THL_A/HLPY)(1\text{-}eff) =$ **0.54** lbs/hr

Daily

$THL_D = (THL_H)(HLPD)(1\text{-}eff) =$ **1.07** lbs/day

Annual

$THL_A = (L_L)(A)(42\ gal/bbl)(1\ ton/2,000\ lbs)(1\text{-}eff)(ROC/THC) = tons/year =$ **0.61** TPY

Processed by: JJM Date: 09/1/09

Notes:

1. Data provided by the applicant
2. AP-42, (Chapter 5, 5th Edition), Table 5.2-1
3. If not otherwise provided, crude oil is assumed to be 50 lb/lb-mole.
4. If not otherwise provided, vapor pressure is calculated from CARB AB-2588 Guidelines, page 103, eq. 25
5. R is calculated by adding 460 to °F.

Revised: September 10, 1997

Attachment A-6
Pt70 'PTO 15001
Purisima Hills LLC - Barham/Boyne Lease
Flare Emission Calculations

			Reference
Flare Throughput	0.400	MMScf/day	Permit Application
Gas Btu Content	1,050	Btu/scf	Permit Application
Sulfur Content	200	ppmv as H2S	Permit Application

Emission Factors	**lb/MMBtu**	**Reference**
NOx	0.0680	AP-42, Table 13.5-1
ROC	0.2000	APCD Emission Factor Guidance (7/13/07)
SOx	0.0342	Mass Balance Calculation
CO	0.3100	AP-42, Table 13.5-1
PM	0.0200	APCD
PM10	0.0200	APCD

Btu Throughput		**Reference**
17.500	MMBtu/hour	Daily divided by 24 hr/day
420.000	MMBtu/day	Permit Application
153,300.0	MMBtu/year	Daily times 365 days/yr

Emissions

	NOx	**ROC**	**SOx**	**CO**	**PM**	**PM10**
lb/hour	1.19	3.50	0.60	5.43	0.35	0.35
lb/day	28.56	84.00	14.37	130.20	8.40	8.40
ton/year	5.21	15.33	2.62	23.76	1.53	1.53

FUGITIVE HYDROCARBON CALCULATIONS - CARB/KVB METHOD

ADMINISTRATIVE INFORMATION
Attachment: A-7
Company: Purisima Hills LLC
Facility: Barham/Boyne Lease
Processed by: JJM
August 1, 2017
Path & File Name:

Version: fhc-kvb5.xls
Date: 16-Nov-12

Reference: CARB speciation profiles #s 529, 530, 531, 532

Data	Value	Units
Number of Active Wells at Facility	17	wells
Facility Gas Production		scf/day
Facility Dry Oil Production		bbls/day
Facility Gas to Oil Ratio (if > 500 then default to 501)	386	scf/bbl
API Gravity	22	degrees API
Facility Model Number	2	dimensionless
No. of Steam Drive Wells with Control Vents	0	wells
No. of Steam Drive Wells with Uncontrolled Vents	0	wells
No. of Cyclic Steam Drive Wells with Control Vents	0	wells
No. of Cyclic Steam Drive Wells with Uncontrolled Vents	0	wells
Composite Valve and Fitting Emission Factor	1.3091	lb/day-well

Lease Model	Valve ROG Emission Factor Without Ethane	Fitting ROG Emission Factor Without Ethane	Composite ROG Emission Factor Without Ethane	
1	1.4921	0.9947	2.4868	lbs/day-well
2	0.6999	0.6092	1.3091	lbs/day-well
3	0.0217	0.0673	0.0890	lbs/day-well
4	4.5090	2.1319	6.6409	lbs/day-well
5	0.8628	1.9424	2.8053	lbs/day-well
6	1.7079	2.5006	4.2085	lbs/day-well

Model #1: Number of wells on lease is less than 10 and the GOR is less than 500.
Model #2: Number of wells on lease is between 10 and 50 and the GOR is less than 500.
Model #3: Number of wells on lease is greater than 50 and the GOR is less than 500.
Model #4: Number of wells on lease is less than 10 and the GOR is greater than 500.
Model #5: Number of wells on lease is between 10 and 50 and the GOR is greater than 500.
Model #6: Number of wells on lease is greater than 50 and the GOR is greater than 500.

ROC Emission Calculation Summary Results Table
Reactive Organic Compounds[c]

	lbs/hr	lbs/day	tons/year
Valves and Fittings[a]	0.19	4.45	0.81
Sumps, Wastewater Tanks and Well Cellars[b]	0.75	18.10	3.30
Oil/Water Separators [b]	0.00	0.00	0.00
Pumps/Compressors/Well Heads[a]	0.01	0.28	0.05
Enhanced Oil Recovery Fields	0.00	0.00	0.00
Total Facility FHC Emissions (ROC)	**0.95**	**22.83**	**4.17**

a: Emissions amount reflect an 80% reduction due to Rule 331 implementation.
b: Emissions reflect control efficiencies where applicable.
c: Due to rounding, the totals may not appear correct

Emission Calculation by Emission Unit

Pumps, Compressors, and Well Heads Uncontrolled Emission Calculations

Number of Wells	17	wells
Wellhead emissions	0.1649	ROC (lb/day)
FHC from Pumps	0.0663	ROC (lb/day)
FHC from Compressors	1.1543	ROC (lb/day)
Total:	1.3855	ROC (lb/day)

Sumps, Uncovered Wastewater Tanks, and Well Cellars

Efficiency Factor: (70% for well cellars, 0% for uncovered WW tanks, sumps and pits)

Unit Type/Emissions Factor

	Heavy Oil Service	Light Oil Service	
Primary	0.0941	0.138	(lb ROC/ft^2-day)
Secondary	0.0126	0.018	(lb ROC/ft^2-day)
Tertiary	0.0058	0.0087	(lb ROC/ft^2-day)

Surface Area and Type (emissions in lbs/day)

Description/Name	Number	Area (ft^2)	Primary	Secondary	Tertiary
Well Cellars[a]	17	633	17.88		
				0.00	
					0.00
(a) A 70% reduction is applied for implementation of Rule 344 (*Sumps, Pits, and Well Cellars*).			17.88	0.00	0.00

Covered Wastewater Tanks

Efficiency Factor: 85%

Surface Area and Type (emissions in lbs/day)

Description/Name	Number	Area (ft^2)	Primary	Secondary	Tertiary
				0.00	
					0.00
			0.00	0.00	0.00

Covered Wastewater Tanks Equipped with Vapor Recovery

Efficiency Factor: 95%

Surface Area and Type (emissions in lbs/day)

Description/Name	Number	Area (ft^2)	Primary	Secondary	Tertiary
Wastewater Tank	1	351		0.22	
			0.00	0.22	0.00

Oil/Water Separators

Efficiency Factor: varies (85% for cover, 95% for VRS, 0% for open top)

Emissions Factor: 560 (lb ROC/MM Gal)

		Type (emissions in lbs/day)			Total
Description/Name	TP-MM Gal	Equipped with Cover	Equipped with VRS	Open Top	lb/day
		0.0			
			0.0		
				0.0	
		0.0	0.0	0.0	0.0

10.3 IDS Database Emission Tables

Table 1
Permitted Potential to Emit (PPTE)

	NO_X	ROC	CO	SO_X	TSP	$PM_{2.5/10}$
PTO 15001 - Barham/Boyne Lease						
lb/day	40.01	112.14	165.03	18.36	9.34	9.34
tons/year	7.30	22.25	30.12	3.35	1.70	1.70

Table 2
Facility Potential to Emit (FPTE)

	NO_X	ROC	CO	SO_X	TSP	$PM_{2.5/10}$
PTO 15001 - Barham/Boyne Lease						
lbs/day	40.01	112.14	165.03	18.36	9.34	9.34
tons/year	7.30	22.25	30.12	3.35	1.70	1.70

Table 3
Federal PtT-70 Facility Potential to Emit (PT 70 FPTE)

	NO_X	ROC	CO	SO_X	TSP	$PM_{2.5/10}$
PTO 15001 - Barham/Boyne Lease						
lbs/day	20.64	33.16	33.95	71.65	1.57	1.57
tons/year	3.76	6.07	6.20	13.08	0.29	0.29

Table 4
Stationary Source Total Potential to Emit

	NO_X	ROC	CO	SO_X	TSP	$PM_{2.5/10}$
PTO 15001 - Barham/Boyne Lease						
lbs/day	376.00	755.64	1113.11	77.85	54.63	54.63
tons/year	68.62	139.03	203.15	14.21	9.97	9.79

10.4 Equipment List

Santa Barbara County Air Pollution Control District – Equipment List

PT-70 15000 / FID: 02637 Barham/Boyne Lease - Barham Ranch / SSID: 02638

A PERMITTED EQUIPMENT

1 Crude Oil Tank

Device ID #	**110246**	***Device Name***	**Crude Oil Tank**
Rated Heat Input		*Physical Size*	1000.00 BBL
Manufacturer		*Operator ID*	Tank #87
Model		*Serial Number*	
Location Note			
Device Description	Dimensions: 21.14 feet high by 16 feet high. Connected to the vapor recovery system.		

2 Crude Oil Tank

Device ID #	**008492**	***Device Name***	**Crude Oil Tank**
Rated Heat Input		*Physical Size*	1000.00 BBL
Manufacturer		*Operator ID*	Tank #88
Model		*Serial Number*	
Location Note			
Device Description	21.14' dia. by 16.0' h. Connected to vapor recovery system.		

3 Crude Oil Tank

Device ID #	**003340**	***Device Name***	**Crude Oil Tank**
Rated Heat Input		*Physical Size*	1000.00 BBL
Manufacturer		*Operator ID*	Tank #89
Model		*Serial Number*	
Location Note			
Device Description	21.14' dia. by 16.0'h. Connected to vapor recovery system.		

4 Wash Tank

Device ID #	**107889**	***Device Name***	**Wash Tank**
Rated Heat Input		*Physical Size*	1500.00 BBL
Manufacturer		*Operator ID*	
Model		*Serial Number*	
Location Note			
Device Description	21.14' diameter x 24.0' h feet high, connected to vapor recovery.		

5 Waste Water Tank

Device ID #	**003341**	***Device Name***	**Waste Water Tank**
Rated Heat Input		*Physical Size*	1000.00 BBL
Manufacturer		*Operator ID*	4
Model	1626SD	*Serial Number*	
Location Note			
Device Description	Bolted tank. Dia. 21.14' by 16.0' h. Connected to vapor recovery.		

6 O&G Wells, Cellars and Unassociated Valves & Flanges

6.1 Oil and Gas Wellheads

Device ID #	**003338**	***Device Name***	**Oil and Gas Wellheads**
Rated Heat Input		*Physical Size*	Total Wells
Manufacturer		*Operator ID*	
Model		*Serial Number*	
Location Note			
Device Description	Well designations: Boyne # 1 -9, Barham 6, 7, 8, 9, 10, 11 and 12 and Otec 1A.		

6.2 Well Cellars

Device ID #	**006335**	***Device Name***	**Well Cellars**
Rated Heat Input		*Physical Size*	633.00 Square Feet Cellar Area
Manufacturer		*Operator ID*	
Model		*Serial Number*	
Location Note			
Device Description	Boyne well 1 has a 6ft by 6 ft cellar. Boyne wells 2 & 5 each have an 8 ft by 8 ft cellar. Boyne wells 3,4,6 & 7 each have an 8 ft diameter cellar. Boyne wells 1A, 8 & 9 each have a 6 ft diameter cellar. Barham wells 6-10 each have a 6 ft diameter cellar. Barham well 11 has an 8 ft diameter cellar.		

6.3 Valves & Fittings

Device ID #	**003346**	***Device Name***	**Valves & Fittings**
Rated Heat Input		*Physical Size*	17.00 Total Wells
Manufacturer		*Operator ID*	
Model		*Serial Number*	
Location Note			
Device Description	Valves, fittings, and flanges not directly associated with other permitted equipment items that emit fugitive hydrocarbons.		

7 Heater Treater

Device ID #	**005144**	***Device Name***	**Heater Treater**
Rated Heat Input	1.370 MMBtu/Hour	*Physical Size*	1.37 MMBtu/Hour
Manufacturer	National Tank Co.	*Operator ID*	
Model	B7513	*Serial Number*	11140-A
Location Note			
Device Description			

8 Boiler

Device ID #	**110245**	***Device Name***	**Boiler**
Rated Heat Input	3.500 MMBtu/Hour	*Operator ID*	
Manufacturer		*Serial Number*	07-30178
Model	Rite Engineering 350WG	*Rule 361 Status*	Existing
Location Note			
Emission Control Basis	Uncontrolled		
Device Description	Equipped with a Power Flame Low NOx Burner, Model LNICR3-G-25B, Serial #110623667. The heat from the boiler is used to aid the oil/water separation process. The boiler is fired exclusively on field gas.		

9 Crude Oil Loading Rack

Device ID #	**003342**	***Device Name***	**Crude Oil Loading Rack**
Rated Heat Input		*Physical Size*	
Manufacturer		*Operator ID*	
Model		*Serial Number*	
Location Note			
Device Description	One grade level loading rack used to load crude oil into highway tanker trucks; connected to vapor recovery.		

10 Flare

Device ID #	**003344**	***Device Name***	**Flare**
Rated Heat Input	17.500 MMBtu/Hour	*Physical Size*	17.50 MMBtu/Hour
Manufacturer	Kaldair Indair	*Operator ID*	
Model	I-6-AS	*Serial Number*	53
Location Note			
Device Description	Continuous use flare equipped with electronic automatic pilot/ignitor (mfr: KEP, model: 100). Used to combust both vapors recovered from storage tanks and loading operations, as well as (produced) gas not used as fuel in heater treater or internal combustion engine(s), flared gas volume determined by: fuel meter (mfr: ITT Barton, model: 202) equipped with chart recorder. Flare heat input based on fuel heat content of 1,050 Btu/scf.		

11 Flare Gas Condensate Scrubber

Device ID #	**104422**	***Device Name***	**Flare Gas Condensate Scrubber**
Rated Heat Input		*Physical Size*	
Manufacturer	AB Southern	*Operator ID*	
Model		*Serial Number*	2029202
Location Note			
Device Description	3.0' diameter x 8.0' high.		

12 Vapor Recovery System

Device ID #	**104423**	***Device Name***	**Vapor Recovery System**
Rated Heat Input		*Physical Size*	15.00 Horsepower (Electric Motor)
Manufacturer	Ingersol Rand	*Operator ID*	
Model	Type 30	*Serial Number*	
Location Note			
Device Description	Vapors recovered by a compressor serving the following equipment with a recovery efficiency of 95% by weight: the 1,500 bbl wash tank, the two 1,000 bbl crude tanks, the 1,000 bbl wastewater tank and the crude loading rack. The VRS compressor is driven by a 15 horsepower (hp) electric motor.		

13 Vapor Recovery Scrubber

Device ID #	**104424**	***Device Name***	**Vapor Recovery Scrubber**
Rated Heat Input		*Physical Size*	
Manufacturer	Wendland Manufacturing Company	*Operator ID*	
Model		*Serial Number*	26980
Location Note			
Device Description	2.5' dia. by 4' high.		

14 Tank Bottoms Pump

Device ID #	**104425**	***Device Name***	**Tank Bottoms Pump**
Rated Heat Input		*Physical Size*	1.50 Horsepower (Electric Motor)
Manufacturer		*Operator ID*	
Model		*Serial Number*	
Location Note			
Device Description	Pump driven by a 1.5 hp electric motor.		

15 Fuel Gas Scrubber

Device ID #	**104426**	***Device Name***	**Fuel Gas Scrubber**
Rated Heat Input		*Physical Size*	
Manufacturer	Pressure Steel Tank Company	*Operator ID*	
Model		*Serial Number*	PST No. A25307
Location Note			
Device Description	Scrubber serves the internal combustion engines. 2' dia. by 5' high.		

16 Oil & Gas Separator

Device ID #	**108763**	***Device Name***	**Oil & Gas Separator**
Rated Heat Input		*Physical Size*	
Manufacturer	Trico - Superior	*Operator ID*	
Model		*Serial Number*	NB21
Location Note			
Device Description	6 feet in diameter by 24 feet high.		

B EXEMPT EQUIPMENT

1 Waste Water Loading Rack

Device ID #	**003343**	*Device Name*	**Waste Water Loading Rack**
Rated Heat Input		*Physical Size*	
Manufacturer		*Operator ID*	
Model		*Serial Number*	
Part 70 Insig?	No	*District Rule Exemption:* 202.202 Unspecified Exemption	
Location Note			
Device Description	Connected to VRS.		

2 Heat Exchanger

Device ID #	**388187**	*Device Name*	**Heat Exchanger**
Rated Heat Input		*Physical Size*	
Manufacturer		*Operator ID*	
Model		*Serial Number*	
Part 70 Insig?	No	*District Rule Exemption:* 202.L.1 Heat Exchangers	
Location Note			
Device Description	Shell and tube heat exchanger. 10.0' long x 36.0" dia.		

Attachment 10.5. Permitted Wells

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CA Well Results [Active Wells only]

County:Santa Barbara 083 Field:Barham Ranch Operator Code:S3525 Lease:H. P. Boyne

District	Operator Name	Field Name	API #	Lease Name	Well	Status	WellType	Township	Range	Base Meridian	Area Code	Area Name
3	Sierra Resources, Inc.	Barham Ranch	08322113	H. P. Boyne	1	A	OG	07N	32W	SB	03	La Laguna
3	Sierra Resources, Inc.	Barham Ranch	08322199	H. P. Boyne	2	A	OG	07N	32W	SB	03	La Laguna
3	Sierra Resources, Inc.	Barham Ranch	08322206	H. P. Boyne	3	A	OG	07N	32W	SB	03	La Laguna
3	Sierra Resources, Inc.	Barham Ranch	08322216	H. P. Boyne	4	A	OG	07N	32W	SB	03	La Laguna
3	Sierra Resources, Inc.	Barham Ranch	08322218	H. P. Boyne	5	A	OG	07N	32W	SB	03	La Laguna
3	Sierra Resources, Inc.	Barham Ranch	08322247	H. P. Boyne	6	A	OG	07N	32W	SB	03	La Laguna

District	Operator Name	Field Name	API #	Lease Name	Well	Status	WellType	Section	Township	Range	Base Meridian	Area Code	Area Name
3	Sierra Resources, Inc.	Barham Ranch	08322415	Barham	6	A	OG	12	07N	32W	SB	06	Old
3	Sierra Resources, Inc.	Barham Ranch	08322484	Barham	7	A	OG	12	07N	32W	SB	06	Old
3	Sierra Resources, Inc.	Barham Ranch	08322501	Barham	8	A	OG	12	07N	32W	SB	06	Old
3	Sierra Resources, Inc.	Barham Ranch	08322522	Barham	10	A	OG	11	07N	32W	SB	03	La Laguna
3	Sierra Resources, Inc.	Barham Ranch	08322579	Barham	9	A	OG	12	07N	32W	SB	06	Old
3	Sierra Resources, Inc.	Barham Ranch	08322697	Barham	11	A	OG	12	07N	32W	SB	06	Old
3	Sierra Resources, Inc.	Barham Ranch	08322815	Barham	12	N	OG	11	07N	32W	SB	06	Old

District	Operator Name	Field Name	API #	Lease Name	Well	Status	WellType	Section	Township	Range	Base Meridian	Area Code	Area Name
3	Sierra Resources, Inc.	Barham Ranch	08322416	Boyne	8	I	OG	12	07N	32W	SB	06	Old
3	Sierra Resources, Inc.	Barham Ranch	08322785	Boyne	10	A	OG	12	07N	32W	SB	06	Old

District	Operator Name	Field Name	API #	Lease Name	Well	Well Status	Pool WellType	Section	Township	Range	Base Meridian	Area Code	Area Name
3	Sierra Resources, Inc.	Barham Ranch	08322286	OTEC Boyne	1A	A	OG	11	07N	32W	SB	06	Old

District	Operator Name	Field Name	API #	Lease Name	Well	Well Status	Pool WellType	Section	Township	Range	Base Meridian	Area Code	Area Name
3	Sierra Resources, Inc.	Barham Ranch	08322380	Purisima Boyne	7	A	OG	12	07N	32W	SB	06	Old

10.6 Insignificant Activities (Stationary Source Totals)

1. Abrasive Blasting (0.05 TPY $PM/PM_{2.5/10}$)
2. Lubricating Oil Storage (0.01 TPY ROC)
3. Various Oils Storage (0.01 TPY)
4. Solvents and Coatings (0.73 TPY ROC)

Attachment 10.7 Fee Statement

FEE STATEMENT

PT-70 No. 15001

FID: 03777 Barham/Boyne Leases / SSID: 02638

Santa Barbara County
Air Pollution Control District

Device No.	Device Name	Fee Schedule	Qty of Fee Units	Fee per Unit	Fee Units	Max or Min. Fee Apply?	Number of Same Devices	Pro Rate Factor	Device Fee	Penalty Fee?	Fee Credit	Total Fee per Device
110246	Crude Oil Tank	A6	42.000	4.07	Per 1000 gallons	No	1	1.000	170.94	0.00	0.00	170.94
008492	Crude Oil Tank	A6	42.000	4.07	Per 1000 gallons	No	1	1.000	170.94	0.00	0.00	170.94
003340	Crude Oil Tank	A6	42.000	4.07	Per 1000 gallons	No	1	1.000	170.94	0.00	0.00	170.94
107889	Wash Tank	A6	63.000	4.07	Per 1000 gallons	No	1	1.000	256.41	0.00	0.00	256.41
003341	Waste Water Tank	A6	42.000	4.07	Per 1000 gallons	No	1	1.000	170.94	0.00	0.00	170.94
003338	Oil and Gas Wellheads	A1.a	1.000	70.99	Per equipment	No	17	1.000	1,206.83	0.00	0.00	1,206.83
003346	Valves & Fittings	A1.a	1.000	70.99	Per equipment	No	1	1.000	70.99	0.00	0.00	70.99
005144	Heater Treater	A3	1.375	532.55	Per 1 million Btu input	No	1	1.000	732.26	0.00	0.00	732.26
110245	Boiler	A3	3.500	532.55	Per 1 million Btu input	No	1	1.000	1,863.93	0.00	0.00	1,863.93
003342	Crude Oil Loading Rack	A1.a	1.000	70.99	Per equipment	No	1	1.000	70.99	0.00	0.00	70.99
104422	Flare Gas Condensate Scrubber	A1.a	1.000	70.99	Per equipment	No	1	1.000	70.99	0.00	0.00	70.99
104423	Vapor Recovery System	A2	15.000	36.80	Per total rated hp	No	1	1.000	552.00	0.00	0.00	552.00
104424	Vapor Recovery Scrubber	A1.a	1.000	70.99	Per equipment	No	1	1.000	70.99	0.00	0.00	70.99
104425	Tank Bottoms Pump	A2	1.500	36.80	Per total rated hp	Min	1	1.000	70.53	0.00	0.00	70.53
104426	Fuel Gas Scrubber	A1.a	1.000	70.99	Per equipment	No	1	1.000	70.99	0.00	0.00	70.99
108763	Oil & Gas Separator	A1.a	1.000	70.99	Per equipment	No	1	1.000	70.99	0.00	0.00	70.99
	Device Fee Sub-Totals =								**$5,791.65**	**$0.00**	**$0.00**	
	Device Fee Total =											**$5,791.65**

Fee Based on Devices **$5,791.65**

Fee Statement Grand Total = $5,791

Notes:

(1) Fee Schedule Items are listed in District Rule 210, Fee Schedule "A".

(2) The term "Units" refers to the unit of measure defined in the Fee Schedule.

Attachment 10.8 Comments on Draft Permit/District Responses

District Responses to Comments on Draft Pt70 PTO 15001

Comment Number	Comment	District Response
1.	Cover page please correct the typo Purisim - Purisima.	This change was made.
2.	Page 3 Section 1.2.1. 3rd bullet Please correct the typo C1 should be IC.	This change was made.
3.	Page 3. Please correct the last sentence of the 2nd paragraph, there is not a dedicated VRU flare, there is a single flare on the Boyne Lease.	This change was made.
4.	Page 6 Section2.1.1. Not all wells are driven by ICEs, there are electric wells in the field as well. Please revise the project description to include the electric wells and that the ICEs use produced gas a fuel.	This change was made.
5.	Page 16 Table 3.2. Should this table include Rule 361.	Yes. Rule 361 was included in Table 3.2.
6.	Page 19 Section 4.7.1. Although rule limits require 90% control efficiency, Sierra achieves 95% vapor recovery system control efficiency.	The vapor recovery system control efficiency was revised to 95% control efficiency.
7.	Page 20 Section 4.10.2. Currently Sierra Resources meters the produced oil, water and gas that is sent to the flare. The fuel to the remaining equipment (ICES and heater) is calculated using the default method assuming worst-case variables. This method has always been acceptable a conservative method. Sierra is requesting that this method remain in use. The ICEs are fueled directly from casing gas line, there are no meters that could be used and remain operable considering the liquids and heavy ends that are present in the casing gas. Sierra is requesting a discussion with the District either in a meeting or a phone call to discuss the extent of required fuel metering required before the final issuance of this permit.	The requirement to meter fuel gas has been replaced with more general language stating that fuel use shall be determined in accordance with a Fuel Use Monitoring Plan to be approved by the District. Plan submittal is required within 60-days of the issuance of the final permit per condition 9C.1(c)(i).
8.	Page 24 Table 5-1.1. Add percent emission reduction to the spreadsheet for the use of the VRU.	This change was made.
9.	Table 5.1-3, Flare CO and SO_x emissions have increased but the variables have remained the same. Please check the calculations.	The CO emission factor in Table 5.1-2 has been revised to be consistent with Attachment A.6, which is correct. CO emissions have been revised (reduced) accordingly. SO_x

Comment Number	Comment	District Response
		emissions are identical to those listed in PTO 8269-R8; there has been no increase.
10.	Page 37, Condition 9.A.3. Sierra Resources objects to being responsible to defend at its sole expense any action brought against the District including court and attorney fees.	This condition was removed.
11.	Page 44 Condition 9.C.1.c.(i). A Fuel Gas Metering Plan is required within 45 days of issuance of the final permit. Sierra is requesting that this plan be submitted within 45 days of the Sierra and the District's agreements regarding the required metering.	See Item 7 above.
12.	Page 44. Condition 9.C.1.c.(i). Requires fuel meter although the alternate method is allowed through Permit Condition 9.C.2.c.(i). Sierra is requesting the alternate method be applied the heater and boiler.	See Item 7 above.
13.	Page 48. Condition C.3.(c)(i) This condition requires annual calibration of a meter that has not even been specked out by Sierra yet alone approved by the District. Sierra is requesting that that the calibration frequency be mandated by manufacturer recommendations.	This permit condition has been revised to require calibration procedures and frequency in accordance with manufacturer recommendations.
14.	Permit Condition C.3(c)(i). This condition is requiring a flare meter that is electronic and district approved. Sierra Resources is requesting that this requirement have an effective date of January 1, 2019.	Permit condition 9C.3(b)(iii) has been revised to require submittal of a Flare Metering Plan for District approval within 60-days of final permit issuance and installation of the meter within 60-days of plan approval.
15.	Page 49 Condition C.4(b)(i). There is no Table 5.1 nor are the total numbers of CLPs listed in any emission tables.	This permit condition was removed.
16.	Page 52 Condition C.11. Based on the issuance date of these permits, Sierra is requesting that the first report that contains all of the required data be submitted as part of the annual/semi - annual report for 2018.	Based on the issuance date of the final permit, the initial semi-annual report will be due September 2018.
17.	Page 53 Condition C.12. This condition references a Flare Gas Monitoring Plan, from Sierra's review, this plan has not been required in a previous permit condition. But, assuming that this requirement is the same as PTO 15000,	See Item 14 above.

Comment Number	Comment	District Response
	Sierra has the same request; that this plan be submitted within 45 days of the District's approval of the electronic meter.	
18.	Equipment List Section 6.1. Please add Barham 12 to oil & gas well heads.	This change was made.
19.	Equipment List 6.2. Check well cellar. Well cellar count is for 16 wells. Please confirm the well cellar area, the total area has been reduced.	The 16 well cellars listed in Item 6.2 of the Equipment List of PTO 8269-R8 total 638 ft^2. This value is consistent with emission calculation sheet A-7 of PTO 8269-R8 and emissions calculation sheet A-7 of PTO 15001. We note that Item 6.2 of the Equipment List in PTO 8269-R8 incorrectly lists 882 ft^2.
20.	Equipment List 6.3. Please correct from 14 to 16 wells.	This was corrected to 17 *total wells*. The Fee statement was corrected accordingly.