San Joaquin Valley
Unified Air Pollution Control District

Best Available Control Technology (BACT) Guideline 7.1.1

Emissions Unit: Steam Enhanced Crude Oil Production Wells
Industry Type: Oil and Gas
Equipment Rating: All
Last Update: April 7, 2026

Pollutant	Achieved in Practice or contained in SIP	Technologically Feasible	Alternate Basic Equipment
VOC	Vapor control system with transfer of vapors to gas pipeline or re-injection to formation. Fugitive defect* and leak** inspection via Audio-Visual-olfactory (AVO) or Optical gas imaging (OGI) inspections once each calendar week. Upon detection of emission or defect using AVO/OGI: First repair – immediately after the emission or defect is detected; Repair completion – pursuant to applicable repair requirements of District Rule 4401. All other leak detection and repair program meeting the requirements of Rule 4401.		
SO_x		SO_x scrubber with 95% sulfur removal or sulfur compounds reduced to no more than 1 gr S/100 dscf	Vapor control system with either transfer of vapors to gas pipeline or re-injection to formation

* as defined in 40 CFR 60.5416c(a)(2)(iii)
** as defined in Table 2 of South Coast AQMD Rule 1173 (11/01/24)

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

Proactive Best Available Control Technology Analysis

District BACT Guideline 7.1.1

Thermally Enhanced Oil Recovery – Steam Enhanced Crude Oil Production Wells

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I. Introduction

The objective of this project is to proactively update Best Available Control Technology (BACT) guideline 7.1.1, which covers thermally enhanced oil recovery – steam enhanced crude oil production wells. This guideline was last updated on December 30, 2020.

This proactive update is necessary to incorporate the most stringent emission control standards that have been achieved in practice. Furthermore, the proactive update to this BACT guideline will bring consistency in implementing the BACT standard throughout the regional offices of the District for new and modified thermally enhanced oil recovery – steam enhanced crude oil production wells triggering BACT. The discussion in this document will be limited to the following items:

- Source of emissions
- Top-Down BACT Analysis for each pollutant
- Recommendation

II. Background

BACT Guideline 7.1.1 for thermally enhanced oil recovery – steam enhanced crude oil production wells was last updated on December 30, 2020. The most current District Rule that helped determined what would be listed in the BACT guideline was The June 16, 2011 version of District Rule 4401 – Steam-Enhanced Crude Oil Production Wells. The most recent amendment of District Rule 4401 occurred on June 15 2023. The amendment was to increase the stringency of leak detection and repair (LDAR) requirements and address deficiencies identified by the EPA. compared to the June 16, 2011 version of Rule 4401, the stringency was increased by reducing the minor leak threshold for components other than PRDs, removing exemptions for specific components, reducing the number of allowable leaks for one to five steam-enhanced crude oil production wells connected to a VOC collection and control system, increasing the required inspection frequency for components other than pipes and unsafe-to-monitor components and reducing the period in which gas leaks greater than 50,000 ppmv and major liquid leaks must be repaired.

Since the December 30, 2020 update of BACT Guideline 7.1.1, applicable federal regulations for TEOR Operations have been amended or updated. 40 CFR part 60 subpart OOOOa has been amended several times. OOOOb and OOOOc were implemented on Mar. 8, 2024.

III. Source of emissions

In thermally enhanced oil recovery (TEOR) operations, steam is injected into the production zone to reduce crude oil viscosity and to pressurize the oil-bearing strata which facilitates oil flow to the well bore. Produced fluids are then piped to the surface

facilities for processing and temporary storage. Pollutants of concern produced by this operation are the following:

- SO_x
- VOC

All pollutants are generated from fugitive hydrocarbon leaks from components.

IV. Top-Down BACT Analysis

BACT analysis

Step 1 - Identify All Possible Control Technologies

The following BACT clearinghouse references were reviewed to determine whether any thermally enhanced oil recovery – steam enhanced wells operations have been required to employ emission controls:

- EPA RACT/BACT/LAER clearinghouse
- CARB BACT clearinghouse
- South Coast AQMD (SCAQMD) BACT clearinghouse
- Bay Area AQMD (BAAQMD) BACT clearinghouse
- Sacramento Metropolitan AQMD (SMAQMD) BACT clearinghouse
- San Diego County APCD (SDCAPCD) BACT clearinghouse
- San Joaquin Valley APCD (SJVAPCD) BACT clearinghouse

Also, the following Rules and Regulations were reviewed to determine what emission limits are currently imposed on steam enhanced wells operations:

- BAAQMD Reg 8, Rule 37 (10/10/90)
- BAAQMD Reg 9, Rule 1 (11/03/21)
- SCAQMD Rule 1173 (11/01/24)
- SJVAPCD Rule 4401 (06/15/23)
- SJVAPCD Rule 4801 (12/17/92)

Finally, the District also conducted a survey of permit limits for TEOR operating wells located in the SJVAPCD. The purpose of the survey was to determine what VOC and SO_x emission control standards are currently being achieved in practice.

A. Survey of BACT Guidelines:

The EPA RACT/BACT/LAER clearinghouse does not include general guidelines, only determinations made by individual agencies. The following determination were found for similar operations:

Guideline	Equipment	Control Technology
CA-0663	Three cyclically steam enhanced oil production wells	*Achieved in Practice:* **VOC:** **1.** Fugitive emissions limited by number of wells, inspection and maintenance program and closed casing vents *Tech Feasible:* None Specified *Alternate Basic Equipment:* None specified
CA-0639	Thermally enhanced oil recovery wells	*Achieved in Practice:* **VOC:** **1.** Vapor control oil-well casing vent piping network with pressure regulators tied into existing tank vapor control system *Tech Feasible:* None Specified *Alternate Basic Equipment:* None specified

The CARB BACT, SCAQMD BACT, BAAQMD BACT, SMAQMD BACT, and SDAQMD BACT clearinghouses do not contain a guideline for this class and category.

The SJVAPCD clearinghouse has one BACT guideline for this class and category. The requirements are shown in the table below:

Guideline	Equipment	Control Technology
7.1.1	Thermally Enhanced Oil Recovery – Steam Enhanced Crude Oil Production Wells	*Achieved in Practice:* **VOC:** 1. Vapor control system and leak detection and repair program meeting the requirements of Rule 4401 *Tech Feasible:* **SO_x:** 1. SO_x Scrubber with 95% sulfur removal or sulfur compounds reduced to no more than 1 gr S/100 dscf *Alternate Basic Equipment:* **VOC:** 1. Vapor control system and with transfer of vapors to gas pipeline or re-injection to formation and leak detection and repair program meeting the requirements of Rule 4401 **SO_x:** 1. Vapor control system and with either transfer of vapors to gas pipeline or re-injection to formation

Summary of BACT Guidelines:

Achieved in Practice

Based on the above information, the following options can be considered achieved in practice BACT emissions limitation for thermally enhanced oil recovery – steam enhanced crude oil production wells:

VOC:

1. Vapor control system and leak detection and repair program meeting the requirements of Rule 4401

Technologically Feasible

SO_x:

1. SO_x Scrubber with 95% sulfur removal or sulfur compounds reduced to no more than 1 gr S/100 dscf

Alternate Basic Equipment

VOC:

1. Vapor control system and with transfer of vapors to gas pipeline or re-injection to formation and leak detection and repair program meeting the requirements of Rule 4401

SO_x:

2. Vapor control system and with either transfer of vapors to gas pipeline or re-injection to formation

B. Survey of Applicable Rules and Regulations:

The rules and regulations listed in the following table are applicable to the BACT analysis. Each applicable section of the listed rules will be discussed in further detail in the following section.

District/Agency	Rule
CARB	**NONE**
Bay Area AQMD	**Reg 8, Rule 37 – Natural Gas and Crude Oil Production Facilities**
	Reg 9, Rule 1 – Sulfur Dioxide
South Coast AQMD	**Rule 1173 – Control of Volatile Organic Compound Leaks and Releases From Components at Petroleum Facilities and Chemical Plants**
San Joaquin Valley APCD	**Rule 4401 - Steam Enhanced Crude Oil Production Wells**
	Rule 4801 – Sulfur Compounds
US EPA	**40 CFR Part 60 Subpart OOOO - Standards of Performance for Crude Oil and Natural Gas Facilities for Which Construction, Modification, or Reconstruction Commenced After August 23, 2011, and on or Before September 18, 2015**
	40 CFR Part 60 Subpart OOOOa - Standards of Performance for Crude Oil and Natural Gas Facilities for Which Construction, Modification, or Reconstruction Commenced After September 18, 2015 and On or Before December 6, 2022
	40 CFR Part 60 Subpart OOOOb - Standards of Performance for Crude Oil and Natural Gas Facilities for Which Construction, Modification, or Reconstruction Commenced After December 6, 2022
	40 CFR Part 60 Subpart OOOOc – Emissions Guidelines for Greenhouse Gas Emissions From Existing Crude Oil and Natural Gas Facilities

Bay Area AQMD

Reg 8, Rule 37 – Natural Gas and Crude Oil Production Facilities

8-37-101: Applicability (Description)

The purpose of this Rule is to limit the emissions of organic compounds from natural gas and crude oil production facilities.

8-37-111 through 8-37-113: Exemptions

Thermally enhanced oil recovery (TEOR) wells do not satisfy the exemption of this rule detailed in sections 8-37-111, '-112 and -113. Therefore, this rule's requirements are applicable to TEOR wells.

8-37-300 Standards

8-37-301 Valves, Flanges, Chokes and Components: A person shall not use any valve, flange, choke or component handling organic compounds in a natural gas or crude oil production facility if the concentration of organic compounds, measured 1 cm from any leak in such equipment exceeds 10,000 ppm (expressed as methane) above background, unless the following requirements are satisfied:

301.1 If the equipment is not essential, the leak shall be repaired within 24 hours.

301.2 IF the equipment is not essential, the leak shall be minimized within 24 hours.

301.3 If the equipment leak which has been minimized as required by subsection 301.2 still exceeds the limitations of Section 8-37-301, that equipment shall be repaired at the next scheduled maintenance of the well head. Any such equipment shall not be operated longer than three months before repairs are conducted.

8-37-302 Liquid Pools: There shall be no open liquid pools of crude oil or condensate in the lease area.

8-37-303 Open Vessels: No open or uncovered vessels of crude material larger than 250 ml shall be kept in the lease area. The well cellar shall be kept covered.

8-37-304 Spills: All spills of crude oil and condensate which causes a liquid pool shall be cleaned up by removal of the liquid within 24 hours of the spill detection.

8-37-305 Pumps and Compressors: A person shall not use any pump or compressor handling organic compounds in natural gas or crude oil production operation if the concentration of organic compounds exceeds 10,000 ppm (as methane),

measured at a distance of 1 cm from the detected source, unless the following requirements are satisfied:

305.1 If the pump or compressor is not essential, that pump or compressor shall be removed from service for leak repairs within 24 hours of the discovery of the leak

305.2 If the spare for the pump or compressor also exceeds the limitation of this section, leak repairs to either pump or compressor shall be completed within 30 days of discovery of its leak and the other pump or compressor may be operated until repairs are completed.

305.5 If the pump or compressor has a packed seal and is essential, the leak shall be minimized within 24 hours of its discovery.

305.6 If the pump or compressor is essential, and has been leak minimized as required by subsection 8-37-305.5 and still exceeds the limitation of this section, that pump or compressor shall be repaired at the next scheduled maintenance of the well head or within three months.

305.7 All pumps and compressors shall be visually inspected at least weekly.

8-37-306 Liquid Leaks: No person shall use any valve, flange, pump, compressor, liquid line or component that has a liquid leak of more than three drops per minute. Such a leak shall be repaired within 24 hours of detection. If repair is not successful, the leaking component shall be replaced within 15 days.

8-37-307 Stuffing Box Leaks: a person shall not use any stuffing box where the concentration of organic compounds exceeds 10,000 ppm (as methane) above background, measured 1 cm from the polish rod box interface or where there is a liquid leak exceeding three drops per minute.

8-37-308 Closed Hatches: All access hatches shall remain closed except during active maintenance or repairs.

8-37-309 Reinspection of Repaired Components: all components subject to Section 8-37-301, 305, 306, and 307 shall be reinspected within one week of repairs.

Reg 9, Rule 1 – Sulfur Dioxide

9-1-101 Applicability (Description)

This Rule establishes emission limits for sulfur dioxide from all sources including ships, and limits ground level concentrations of sulfur dioxide.

9-1-300 Standards

9-1-302 General Emission Limitation:

A person shall not emit from any source, other than a ship, a gas stream containing sulfur dioxide in excess of 300 ppm (dry). This section shall not apply to the following sources:

302.1 Any source which is subject to any of the limitations in Sections 9-1-304 through 9-1-312

302.2 Any source which satisfies the conditions in Sections 9-1-110

TEOR operation are not subject to any of the limitations in section 9-1-304 through 9-1-312 nor do they satisfy the conditions of sections 9-1-110. Therefore, they are subject to the emission limits of section 9-1-302.

South Coast AQMD

Rule 1173 – Control of Volatile Organic Compound Leaks and Releases From Components at Petroleum Facilities and Chemical Plants

Purpose

This rule is intended to control Volatile Organic Compound (VOC) Leaks from Components, Releases from Atmospheric Process Pressure Relief Devices (PRDs), and establish Contingency Measures for applicable ozone standards for the reduction of VOC.

Applicability

(1) This rule applies to Refineries, Chemical Plants, Lubricating Oil and Grease Re-refiners, Marine Terminals, Oil and Gas Production Fields, Natural Gas Processing Plants, and Pipeline Transfer Stations.

(2) Subdivision (k) shall not become applicable until the effective date of final and full approval by the United States Environmental Protection Agency (U.S. EPA) of the California State Implementation Plan (SIP) as meeting the Contingency Measure requirements of the Clean Air Act Sections 172(c)(9) and 182(c)(9) for the South

Coast Air Basin regarding the 2008 and 2015 ozone National Ambient Air Quality Standards (NAAQS).

TEOR operations consist of oil producing wells, Therefore, this rule is applicable.

Requirements

South Coast AQMD Inspection Procedures

(1) Effective January 1, 2026, the owner or operator of a facility shall be in violation of this rule if South Coast AQMD personnel detect using an appropriate analyzer in accordance with the test method in paragraph (j)(1) a Component exceeding the applicable standard listed in Table 1 – Violation Standards:

Table 1 – Violation Standards

Component Service	Violation Standard
Light Liquid or Gas/Vapor	10,000 ppm
Heavy Liquid	500 ppm

(2) The owner or operator of a facility shall be in violation of this rule if South Coast AQMD personnel detect a Component with a Visible Leak.

(3) Effective January 1, 2026, the owner or operator of a facility shall be in violation of this rule if South Coast AQMD personnel detect a Component with Visible Vapors, unless the owner or operator concurrently demonstrates, or no later than one (1) calendar day after detection for an Inaccessible Component, using an appropriate analyzer in accordance with the test method in paragraph (j)(1) or another method approved by the Executive Officer to the satisfaction of South Coast AQMD personnel that the Component is not exceeding the applicable standard listed in Table 1 – Violation Standards.

(4) The owner or operator of a facility shall be in violation of this rule if South Coast AQMD personnel observe open-ended lines and Valves located at the end of lines that are not sealed with a blind Flange, plug, cap, or a second closed Valve at all times, except during operations requiring process fluid flow through the open-ended line.

Identification Requirements

The owner or operator shall:

(1) Physically identify clearly and visibly all Major Components, except Fin Fans, in Light Liquid or gas/vapor service, all Pumps in Heavy Liquid service, and, effective January 1, 2026, all Fin Fans in VOC service, for Inspection, Repair, and recordkeeping purposes.

(2) Clearly identify all Major Components, except Fin Fans, in Heavy Liquid service other than Pumps subject to paragraph (e)(1), and Minor Components, in piping and instrumentation flow diagrams or group them together functionally for Inspection, Repair, and recordkeeping purposes.

(3) Submit the information required to identify Components in Heavy Liquid service, as required by paragraphs (e)(1) and (e)(2), for approval by the Executive Officer.

(4) Any changes in Major Component identification shall require prior written approval from the Executive Officer.

(5) Physically identify clearly and visibly each Component under Repair near the source of leakage with physical identification larger and of a different color than that used in accordance with paragraph (e)(1) and maintain such Components physically identified until Repair is complete.

Self Inspection Requirements

(1) The owner or operator of a facility, except for unmanned Oil and Gas Production Fields and unmanned Pipeline Transfer Stations, shall conduct an AVO Inspection of all accessible Pumps, Compressors, and Atmospheric Process PRDs at least once per operating shift, and no more than 12 hours between AVO Inspections. The owner or operator of an unmanned Oil and Gas Production Field or an unmanned Pipeline Transfer Station shall conduct an AVO Inspection of all accessible Pumps, Compressors, and Atmospheric Process PRDs at least once per calendar week.

(2) Effective January 1, 2026, the owner or operator of a facility shall conduct an OGI Inspection of Components at least once per calendar month, unless a Component will be out of service for more than 14 calendar days of the calendar month due to Outage or Turnaround.

(A) The owner or operator conducting an OGI Inspection shall complete a manufacturer's certification or training program, or equivalent CARB training for the OGI Device used to conduct the Inspection.

(B) The owner or operator conducting an OGI Inspection shall operate and maintain the OGI Device in accordance with the manufacturer's specifications and recommendations.

(C) In lieu of an OGI Inspection, the owner or operator may elect to use an alternative Inspection method approved in writing by U.S. EPA that is equivalent or more stringent than an OGI Inspection. The owner or operator seeking to use an alternative Inspection method shall submit the written approval from U.S. EPA to the Executive Officer for their review and independent approval.

(3) The owner or operator of a facility shall conduct an Analyzer Inspection:

(A) Quarterly, of all accessible Components, except Fin Fans, in Light Liquid or gas/vapor service, and all Pumps in Heavy Liquid service.

(B) Annually, of all Inaccessible Components, except Fin Fans, in Light Liquid or gas/vapor service and, effective January 1, 2026, all Fin Fans in VOC service.

(C) After every Release from a PRD within one (1) calendar day and an additional Analyzer Inspection within 14 calendar days.

(D) After every Repair of a Component within 30 calendar days of Repair.

(E) Using an electronic recording instrument, operated and maintained according to manufacturer's specifications, to simultaneously record all readings in an electronic format, at a Refinery with more than 25,000 Components.

(4) The owner or operator may apply for written approval from the Executive Officer to change the Analyzer Inspection frequency for each type of accessible Component as required in subparagraph (f)(3)(A) from quarterly to annually provided that all accessible Components of that type at the facility have been successfully operated and maintained for five consecutive calendar quarters with no Visible Leaks, no Visible Vapors, and no Leaks exceeding the applicable standard listed in Table 1– Violation Standards.

(5) The owner or operator shall submit documentation prior to the change in Inspection frequency, as per paragraph (f)(4) for written approval from the Executive Officer.

(6) The owner or operator shall revert to a quarterly Analyzer Inspection frequency for a Component type should AVO Inspection, OGI Inspection, the annual Analyzer Inspection, or South Coast AQMD Inspection detect any of the following, applicable to the Component type, listed below, either:
(A) A Visible Leak;

(B) Visible Vapors; or

(C) A Leak exceeding the applicable standard listed in Table 1 – Violation Standards.

<u>Leak Standards and Repair Requirements</u>

Effective January 1, 2026:

(1) The owner or operator of a facility shall Repair all Components exceeding the applicable standard listed in Table 2 – Component Leak Standards:

Table 2 – Component Leak Standards

Component Type	Leak Standard
Compressor or Pump (Light Liquid)	400 ppm
Pressure Relief Device (PRD)	200 ppm
Pump (Heavy Liquid)	100 ppm
Valve, Fitting, or other device (diaphragm, Hatch, sight-glass, meter)	100 ppm
Fin Fan	100 ppm

(2) For a Component other than a Fin Fan exceeding the applicable standard listed in Table 2 – Component Leak Standards, the owner or operator shall:
  (A) If the Component exceeds the applicable standard listed in Table 1 –Violation Standards, no later than one (1) calendar day after detection, either:
    (i) Demonstrate the Component does not emit Visible Vapors using an OGI Device; or
    (ii) Demonstrate the Component does not exceed the applicable standard listed in Table 1 – Violation Standards using an appropriate analyzer in accordance with the test method in paragraph (j)(1); and
  (B) Within 14 calendar days of detection, complete Repair of the Component below the applicable standard listed in Table 2 – Component Leak Standards, except for a limited number of Essential Components, rounded up to the next whole number of Essential Components listed in Table 3 –Limited Delay of Repair and as determined on the last calendar day of each calendar quarter, provided each such Essential Component does not exceed the applicable standard listed in Table 3 – Limited Delay of Repair and Repair is completed no later than the end of the next Outage or Turnaround, whichever comes first, for the Process Unit that includes each such Essential Component:

Table 3 – Limited Delay of Repair

Essential Component Type	Delay Leak Standard	Total Number Allowed
Valve or Fitting	500 ppm	0.05% of facility total number of Valves and Fittings
Compressor or Pump (Light Liquid)	500 ppm	0.05% of facility total number of Compressors and Pumps (Light Liquid)

(3) For a Visible Leak from an accessible Component other than a Fin Fan, the owner or operator shall, no later than one (1) calendar day after detection, eliminate the Visible Leak.

(4) For a Visible Leak from an Inaccessible Component other than a Fin Fan, the owner or operator shall:

(A) Within 24 hours of detection, electronically notify the Executive Officer in an approved format, or in writing via Rule1173Reports@aqmd.gov if no format is approved; and
(B) Within 14 calendar days of detection, eliminate the Visible Leak.

(5) For Visible Vapors from an accessible Component other than a Fin Fan, the owner or operator shall, no later than one (1) calendar day after detection, either:
(A) Eliminate the Visible Vapors; or
(B) Demonstrate the Component does not exceed the applicable standard listed in Table 1 – Violation Standards using an appropriate analyzer in accordance with the test method in paragraph (j)(1) and, within 14 calendar days of detection, complete Repair of the Component below the applicable standard listed in Table 2 – Component Leak Standards.

(6) For Visible Vapors from an Inaccessible Component other than a Fin Fan, the owner or operator shall:
(A) Within 14 calendar days of detection, eliminate the Visible Vapors; and
(B) If Visible Vapors are not eliminated within seven (7) calendar days of detection, within eight (8) calendar days of detection electronically notify the Executive Officer in an approved format, or in writing via Rule1173Reports@aqmd.gov if no format is approved.

(7) For either a Fin Fan exceeding the applicable standard listed in Table 2 – Component Leak Standards, a Visible Leak from a Fin Fan, or Visible Vapors from a Fin Fan, the owner or operator shall:

(A) No later than 14 calendar days after detection, either:
(i) Demonstrate the Fin Fan does not emit Visible Vapors using an OGI Device; or
(ii) Demonstrate the Fin Fan does not Leak at a rate exceeding 5,000 ppm using an appropriate analyzer in accordance with the test method in paragraph (j)(1); and
(B) No later than the end of the next Outage or Turnaround, whichever comes first, of the Process Unit that includes the Fin Fan, complete Repair of the Fin Fan below the applicable standard listed in Table 2 – Component Leak Standards.

(8) As determined on the last calendar day of each calendar quarter, the owner or operator of a facility with a Fin Fan shall not allow more than 1% of the facility total number of Fin Fan Plugs, rounded up to the next whole number, to leak at a rate exceeding the applicable standard listed in Table 2 – Component Leak Standards.

Atmospheric Process PRD Requirements

The requirements of this section do not apply to steam enhanced oil recovery wells as they are not a chemical plant, refinery, lubricating oil and grease re-refiner, or a marine terminal.

Recordkeeping and Reporting Requirements

(1) The owner or operator shall record all Leaks, Visible Leaks, Visible Vapors, Repairs, Components awaiting Repair, and Inspections in an electronic format approved by the Executive Officer and submit those records electronically to the Executive Officer in an approved format, or in writing via Rule1173Reports@aqmd.gov if no format is approved, as quarterly or annual Inspection reports to the Executive Officer no later than 30 days after the end of each calendar quarter or no later than 60 days after the end of the calendar year, respectively.

(2) The owner or operator shall include in all records of Inspection, at a minimum, the Component identification and type, Repair, location, Leak rate, and date and time of Inspection. The owner or operator shall maintain these records for a period of at least five (5) years and make them available to the Executive Officer, upon request.

Section (3) does not apply to TEOR operations as they are not a Refinery, Chemical Plant, Lubricating Oil and Grease Re-refiner, or Marine Terminal.

(4) The reporting provisions of Rule 430 shall not be applicable to Components being Repaired under the provisions of this rule, except Compressors.

Test Methods

(1) Measurements of Leak concentrations shall be conducted according to the U.S. EPA Reference Method 21 using an appropriate analyzer calibrated with methane. The analyzer shall be calibrated before Analyzer Inspection each day.

(2) The VOC content shall be determined according to ASTM Methods D 1945, D 7833, or D 2163 for gases, South Coast AQMD Method 304-91 for liquids. The percent VOC of a liquid evaporated at 150ºC (302ºF) shall be determined according to ASTM Method D 86.

(3) The flash point of Heavy Liquids shall be determined according to ASTM Method D 93.

(4) The owner or operator may use another method to determine compliance with this rule provided it is demonstrated to be equivalent and approved in writing by the Executive Officer, CARB, and U.S. EPA.

San Joaquin Valley APCD

Rule 4401 – Steam-Enhanced Crude Oil Production Wells

Purpose

The purpose of this rule is to limit emissions of Volatile Organic Compound (VOC) emissions from steam-enhanced crude oil production wells.

Applicability

This rule is applicable to all steam-enhanced crude oil production wells and any associated VOC collection and control systems.

Rule Requirements

Section 3.20 details the definition of a leak and contains table 2, which details the criteria for Gas leaks in ppmv as Methane. Any liquid or gas coming from a component undergoing repair or replacement, or during sampling of process fluid from a component into a container is not considered a leak provided such activities are done as expeditiously as possible and with minimal spillage of material and VOC emission to the atmosphere.

Rule 4401, Table 2 – Gas Leak in ppmv as Methane after June 30, 2024		
Type of Component	Major Gas Leak	Minor Gas Leak
1. PRDs	Greater than 10,000 to 50,000	400 to 10,000
2. Components other than PRDs	Greater than 10,000 to 50,000	500 to 10,000

Major liquid leaks are a visible mist or a continuous flow of liquid that is not seal lubricant (section 3.20.1).

Minor liquid leaks are a liquid leak, except seal lubricant, that is not a major liquid leak and drips liquid at a rate of more than three drops per minute (Section 3.20.2).

Section 5.2 of this rule states an operator shall comply with the following:

5.2.1 An operator shall be in violation of this rule if any District inspection demonstrates that one or more of the conditions in section 5.2. exist at the facility or if any operator inspection conducted pursuant to Section 5.4 demonstrates that one or more of the conditions in section 5.2.2 exist at the facility.

Section 5.2.2 details the Leak standards are the existence of

- an open-ended line or a valve located at the end of the line that is not sealed with a blind flange, plug, cap or a second closed valve that is not closed at all times, except during attended events (Section 5.2.2.1)
- a component with a major liquid leak as defined in section 3.0
- Existence of a component leak described in Section 5.2.2.4.1 through Section 5.2.2.4.3 in excess of the allowable number of leaks specified in Table 3 or Table 4. (Section 5.2.2.4)
  - A minor liquid leak, or (Section 5.2.2.4.1)
  - A minor gas leak, or (Section 5.2.2.4.2)
  - A gas leak greater than 10,000 ppmv up to 50,000 ppmv (Section 5.2.2.4.3)

Table 3 of this rule will not be discussed as the values listed were for determining compliance prior to June 30, 2024.

Table 4 of this rule details the criteria for number of allowable leaks

Table 4 – Number of Allowable Leaks after June 30, 2024	
Number of Steam-Enhanced Crude Oil Production Wells Connected to a VOC Collection and Control System	Number of Allowable Leaks
1 to 5	0
6 to 25	3
26 to 50	6
51 to 100	8
101 to 250	10
251 to 500	15
More than 500	One (1) for each 20 wells tested with a minimum of 50 wells tested.

Section 5.4 details the Inspection and re-inspection requirements.

- Unless otherwise specified, an operator shall perform all component inspections and gas leak measurements pursuant to the requirements of Section 6.3.3.

  - (After June 30, 2024) except for pipes and unsafe-to-monitor (UtM) components, an operator shall inspect all other components pursuant to the requirements of Section 6.3.3 at least once every year (5.4.2)
  - An operator shall visually inspect all pipes at least once a year. Any visual inspection of pipes that indication a leak that cannot be immediately repaired to meet the leak standards of this rule shall be inspected within 24 hours after detecting the leak. If a leak is found, the leak shall be repaired as soon as practicable but not later than the time frame specified in Table 5 of this rule. (5.4.3)

- In addition to the inspections required by Section 5.4.1 [and 5.4.2 after June 30, 2024], an operator shall inspect for leaks all accessible operating pumps, compressors, and PRDs in service as follows(5.4.4):
  - An operator shall audio-visually (by hearing and by sight) inspect for leaks all accessible operating pumps, compressors, and PRDs in service at least once each calendar week. (5.4.4.1)
  - Any audio-visual inspection of an accessible operating pump, compressor, and PRD performed by an operator that indicates a leak that cannot be immediately repaired to meet the leak standards of this rule shall be inspected not later than 24 hours after conducting the audio-visual inspection. If a leak is found, the leak shall be repaired as soon as practicable but not later than the frame specified in Table 5 until June 30, 2024, and Table 6 after June 30, 2024. (5.4.4.2)
- In addition to the inspections required by Section 5.4.1, Section 5.4.3 and Section 5.4.4, an operator shall perform the following inspections (5.4.5):
  - An operator shall initially inspect a PRD that releases to the atmosphere as soon as practicable but not later than 24 hours after the discovery of the release. An operator shall re-inspect the PRD not earlier than 24 hours after the initial inspection but not later than 15 calendar days after the initial inspection. (5.4.5.1)
  - An operator shall inspect all new, replaced, or repaired fittings, flanges and threaded connections withing 72 hours of placing the component in service. (5.4.5.2)
  - Except for PRDs subject to the requirements of Section 5.4.5.1, an operator shall inspect a component that has been repaired or replaced not later than 15 calendar days after the component was repaired or replaced. (5.4.5.3)
- An operator shall inspect all UtM components during each turnaround. (5.4.6)
- A District inspection in no way fulfills any of the mandatory inspection requirements that are placed upon operators and cannot be used or counted as an inspection required of an operator. (5.4.7)

Section 5.5 details the leak repair requirements. An operator shall:

- Affix a readily visible weatherproof tag to all leaking components upon detection of the leak. The following information shall be included on the tag (5.5.1):
  - The date and time of leak detection and of leak measurement (5.5.1.1 and 5.5.1.2)
  - For a gaseous leak, the leak concentration in ppmv (5.5.1.3)
  - For a liquid leak, whether it is a major liquid leak or a minor liquid leak (5.5.1.4)
  - Whether the component is an essential component, an unsafe-to-monitor component or a critical component.
- Keep the tag affixed to the component until an operator has met all of the following conditions (5.5.2):
  - Repaired or replaced the leaking component, and (5.5.2.1)

  - Re-inspected the component using the test method in Section 6.3.3., and (5.5.2.2)
  - The component is found to be in compliance with the requirements of this rule. (5.5.2.3)
- An operator shall minimize a component leak in order to stop or reduce leakage to the atmosphere immediately to the extent possible, but not later than one (1) hour after detection of the leak. (5.5.3)
- Except for leaking critical components or leaking essential components subject to the requirements of Section 5.5.7, if an operator has minimized a leak but the leak still exceeds the applicable leak limits as defined in section 3.0, an operator shall comply with at least one of the requirements of Section 5.5.4.1, 5.5.4.2, or 5.5.4.3 as soon as practicable but not later than the time period specified in Table 5 or Table 6. (5.5.4)
  - Repair or replace the leaking component; or (5.5.4.1)
  - Vent the leaking component to a VOC collection and control system as defined in Section 3.0, or (5.5.4.2)
  - Remove the leaking component from operation (5.5.4.3)

Table 5 of this rule will not be discussed as the values listed were for determining compliance prior to June 30, 2024.

Table 6 of this rule details the repair period:

Table 6 – Repair Period after June 30, 2024	
Type of Leak	**Repair Period in Calendar Days**
Gas Leaks	
Minor Gas Leak	14
Major Gas Leak less than or equal to 50,000 ppmv	5
Gas Leak greater than 50,000 ppmv	1
Liquid Leaks	
Minor Liquid Leak	3
Major Liquid Leak	1

The leak rate measured after leak minimization has been performed shall be the leak rate used to determine the applicable repair period specified in table 5. (5.5.5)

The time of the initial leak detection shall be the start of the repair period specified in Table 5 or Table 6. (5.5.6)

If the leaking component is an essential component or a critical component that cannot be immediately shut down for repairs, and if the leak has been minimized but the leak still exceeds the applicable leak standard of this rule, the operator shall repair or replace the

essential component or critical component to eliminate the leak during the next process unit turnaround, but in no case later than one year from the date of the original detection, whichever comes earlier. (5.5.7)

After June 30, 2024, if a leaking component requires rig-up operation to complete repair, an extended repair period may be granted for up to 30 calendar days from initial leak detection under the following conditions (5.5.8):

- The operator shall provide written notification to the District within the compliant repair period. Notification shall include the following (5.5.8.1):
  - The permit to operate (PTO) number and physical location of the well being repaired (5.5.8.1.1)
  - The date and time the component was found to be leaking and the leak concentration. (5.5.8.1.2)
  - Proof that equipment or other required Services necessary to make the repairs have been ordered or scheduled. (5.5.8.1.3)
- The operator shall submit a written notification to the District within seven (7) calendar days of completing the repairs and re-inspecting the component using the test method listed in Section 6.3.3. (5.5.8.2)
- Operators who fail to comply with all of the requirements specified in Sections 5.5.8.1 and 5.5.8.2 shall be in violation with the provisions of this rule. (5.5.8.3).

Section 6.3 details the test methods required by this rule.

Test methods that are equivalent to those test methods specified in Section 6.3.1 through Section 6.35. may be used provide that such equivalent test methods have been previously approved, in writing, by the EPA, ARB and APCO.

- The control efficiency of any VOC control device, measured and calculated as carbon, shall be determined by EPA Method 25, except when the outlet concentration must be below 50 ppm in order to meet the standard, in which case EPA Method 25a may be used. EPA Method 18 may be used in lieu of EPA Method 25 or EPA Method 25a provided the identity and approximate concentrations of the analytes/compounds in the sample gas stream are known before analysis with the gas chromatograph and the gas chromatograph is calibrated for each of those known analyte/compound to ensure that the VOC concentrations are neither under- or over-reported. (6.3.1)
- VOC content shall be analyzed by using the latest revision of ASTM Method E168, E169, or E260 as applicable. Analysis of halogenated exempt compounds shall be performed by using ARB Method 432. (6.3.2)
- Leak inspection, other than audio-visual, and measurements of gaseous leak concentrations shall be conducted according to EPA Method 21 using an appropriate portable hydrocarbon detection instrument calibrated with methane. The instrument shall be calibrated in accordance with the procedures specified in EPA Method 21 or the manufacturer's instruction, as appropriate, not more than 30 days prior to its use. The operator shall record the calibration date of the

instrument. Where safety is a concern, such as measuring leaks from compressor seals or pump seals when the shaft is rotating, a person shall measure leaks by placing the instrument probe inlet at a distance of one (1) centimeter or less from the surface of the component interface. (6.3.3)
    - After June 30, 2024, All leaks detected with the use of an OGI instrument shall be measured using EPA Reference Method 21 within two (2) calendar days of initial OGI leak detection or within 14 calendar days of initial OGI leak detection of an inaccessible or unsafe to monitor component to determine compliance with the leak thresholds and repair timeframes specified in Table 6. (6.3.3.1)
- The VOC content by weight percent (wt.%) shall be determined using American Society of Testing and Materials (ASTM) D1945 for gases and South Coast Air Quality Management District (SCAQMD) Method 304-91 or the latest revision of ASTM Method E168, E169 or E260 for liquids. (6.3.4)

Rule 4801 – Sulfur Compounds

Purpose

The purpose of this rule is to limit the emissions of sulfur compounds. A maximum concentration and test method are specified.

Applicability

The provisions of this rule shall apply to any discharge to the atmosphere of sulfur compounds, which would exist as a liquid or a gas at standards conditions.

Requirements

3.1 A person shall not discharge into the atmosphere sulfur compounds, which would exist as a liquid or gas at standard conditions, exceeding in concentration at the point of discharge: two-tenths (0.2) percent by volume calculated as sulfur dioxide (SO_2), on a dry basis averaged over 15 consecutive minutes.

3.2 EPA Method 8 and ARB Method 1-100 (Continuous Emission Stack Sampling) shall be used to determine such emissions.

TEOR operations are capable of discharging sulfur compounds into the atmosphere as gas at standard conditions. Therefore, TEOR operations are subject to rule 4801.

EPA

40 CFR Part 60 Subpart OOOO - Standards of Performance for Crude Oil and Natural Gas Facilities for Which Construction, Modification, or Reconstruction Commenced After August 23, 2011, and on or Before September 18, 2015

§ 60.5360 What is the purpose of this subpart?

This subpart establishes emission standards and compliance schedules for the control of volatile organic compounds (VOC) and sulfur dioxide (SO_2) emissions from affected facilities that commence construction, modification, or reconstruction after August 23, 2011, and on or before September 18, 2015.

§ 60.5365 Am I subject to this subpart?

You are subject to the applicable provisions of this subpart if you are the owner or operator of one or more of the onshore affected facilities listed in paragraphs (a) through (g) of this section for which you commence construction, modification, or reconstruction after August 23, 2011, and on or before September 18, 2015. An affected facility must continue to comply with the requirements of this subpart until it begins complying with a more stringent requirement, that applies to the same affected facility, in an approved, and effective, state or Federal plan that implements subpart OOOOc of this part, or modifies or reconstructs after December 6, 2022, and thus becomes subject to subpart OOOOb of this part.

(a). Each gas well affected facility, which is a single natural gas well.

(b). Each centrifugal compressor affected facility, which is a single centrifugal compressor using wet seals that is located between the wellhead and the point of custody transfer to the natural gas transmission and storage segment. A centrifugal compressor located at a well site, or an adjacent well site and servicing more than one well site, is not an affected facility under this subpart.

(c). Each reciprocating compressor affected facility, which is a single reciprocating compressor located between the wellhead and the point of custody transfer to the natural gas transmission and storage segment. A reciprocating compressor located at a well site, or an adjacent well site and servicing more than one well site, is not an affected facility under this subpart.

(d).

(1) For the oil production segment (between the wellhead and the point of custody transfer to an oil pipeline), each pneumatic controller affected facility, which is a single continuous bleed natural gas-driven pneumatic controller operating at a natural gas bleed rate greater than 6 standard cubic feet per hour.

(2) For the natural gas production segment (between the wellhead and the point of custody transfer to the natural gas transmission and storage segment and not including natural gas processing plants), each pneumatic controller affected facility, which is a single continuous bleed natural gas-driven pneumatic controller operating at a natural gas bleed rate greater than 6 standard cubic feet per hour.

(3) For natural gas processing plants, each pneumatic controller affected facility, which is a single continuous bleed natural gas-driven pneumatic controller.

(e). Each storage vessel affected facility, which is a single storage vessel located in the oil and natural gas production segment, natural gas processing segment or natural gas transmission and storage segment, and has the potential for VOC emissions equal to or greater than 6 tons per year (tpy) as determined according to this section by October 15, 2013, for Group 1 storage vessels and by April 15, 2014, or 30 days after startup (whichever is later) for Group 2 storage vessels, except as provided in paragraphs (e)(1) through (4) of this section. The potential for VOC emissions must be calculated using a generally accepted model or calculation methodology, based on the maximum average daily throughput determined for a 30-day period of production prior to the applicable emission determination deadline specified in this section. The determination may take into account requirements under a legally and practically enforceable limit in an operating permit or other requirement established under a Federal, State, local or Tribal authority.

(1) For each new, modified or reconstructed storage vessel receiving liquids pursuant to the standards for gas well affected facilities in § 60.5375, including wells subject to § 60.5375(f), you must determine the potential for VOC emissions within 30 days after startup of production.

(2) A storage vessel affected facility that subsequently has its potential for VOC emissions decrease to less than 6 tpy shall remain an affected facility under this subpart.

(3) For storage vessels not subject to a legally and practically enforceable limit in an operating permit or other requirement established under Federal, state, local or tribal authority, any vapor from the storage vessel that is recovered and routed to a process through a VRU designed and operated as specified in this section is not required to be included in the determination of VOC potential to emit for purposes of determining affected facility status, provided you comply with the requirements in paragraphs (e)(3)(i) through (iv) of this section.

(i) You meet the cover requirements specified in § 60.5411(b).

(ii) You meet the closed vent system requirements specified in § 60.5411(c).

(iii) You maintain records that document compliance with paragraphs (e)(3)(i) and (ii) of this section.

(iv) In the event of removal of apparatus that recovers and routes vapor to a process, or operation that is inconsistent with the conditions specified in paragraphs (e)(3)(i) and (ii) of this section, you must determine the storage

vessel's potential for VOC emissions according to this section within 30 days of such removal or operation.

(4) The following requirements apply immediately upon startup, startup of production, or return to service. A storage vessel affected facility that is reconnected to the original source of liquids is a storage vessel affected facility subject to the same requirements that applied before being removed from service. Any storage vessel that is used to replace any storage vessel affected facility is subject to the same requirements that apply to the storage vessel affected facility being replaced.

(5) A storage vessel with a capacity greater than 100,000 gallons used to recycle water that has been passed through two stage separation is not a storage vessel affected facility.

(f). The group of all equipment, except compressors, within a process unit is an affected facility.

(1) Addition or replacement of equipment for the purpose of process improvement that is accomplished without a capital expenditure shall not by itself be considered a modification under this subpart.

(2) Equipment associated with a compressor station, dehydration unit, sweetening unit, underground storage vessel, field gas gathering system, or liquefied natural gas unit is covered by §§ 60.5400, 60.5401, 60.5402, 60.5421, and 60.5422 of this subpart if it is located at an onshore natural gas processing plant. Equipment not located at the onshore natural gas processing plant site is exempt from the provisions of §§ 60.5400, 60.5401, 60.5402, 60.5421, and 60.5422 of this subpart.

(3) The equipment within a process unit of an affected facility located at onshore natural gas processing plants and described in paragraph (f) of this section are exempt from this subpart if they are subject to and controlled according to subparts VVa, GGG or GGGa of this part.

(g).Sweetening units located at onshore natural gas processing plants that process natural gas produced from either onshore or offshore wells.

(1) Each sweetening unit that processes natural gas is an affected facility; and

(2) Each sweetening unit that processes natural gas followed by a sulfur recovery unit is an affected facility.

(3) Facilities that have a design capacity less than 2 long tons per day (LT/D) of hydrogen sulfide (H2S) in the acid gas (expressed as sulfur) are required to comply with recordkeeping and reporting requirements specified in §

60.5423(c) but are not required to comply with §§ 60.5405 through 60.5407 and §§ 60.5410(g) and 60.5415(g) of this subpart.

(4) Sweetening facilities producing acid gas that is completely reinjected into oil-or-gas-bearing geologic strata or that is otherwise not released to the atmosphere are not subject to §§ 60.5405 through 60.5407, 60.5410(g), 60.5415(g), and 60.5423 of this subpart.

(h). The following provisions apply to gas well facilities that are hydraulically refractured.

(1) A gas well facility that conducts a well completion operation following hydraulic refracturing is not an affected facility, provided that the requirements of § 60.5375 are met. For purposes of this provision, the dates specified in § 60.5375(a) do not apply, and such facilities, as of October 15, 2012, must meet the requirements of § 60.5375(a)(1) through (4).

(2) A well completion operation following hydraulic refracturing at a gas well facility not conducted pursuant to § 60.5375 is a modification to the gas well affected facility.

(3) Refracturing of a gas well facility does not affect the modification status of other equipment, process units, storage vessels, compressors, or pneumatic controllers located at the well site.

(4) A gas well facility initially constructed after August 23, 2011, and on or before September 18, 2015 is considered an affected facility regardless of this provision.

Section 60.5430 of this subpart defines a gas well or natural gas well as an onshore well drilled principally for production of natural gas. TEOR operations or steam enhanced wells are primarily for the production of oil. Thus, TEOR operations do not meet the definition of gas wells or natural gas wells; thus, the requirements of this subpart are not applicable.

40 CFR Part 60 Subpart OOOOa - Standards of Performance for Crude Oil and Natural Gas Facilities for Which Construction, Modification, or Reconstruction Commenced After September 18, 2015 and On or Before December 6, 2022

§ 60.5360a What is the purpose of this subpart?

Scope. This subpart establishes emission standards and compliance schedules for the control of the pollutant greenhouse gases (GHG). The greenhouse gas standard in this subpart is in the form of a limitation on emissions of methane from affected facilities in the crude oil and natural gas source category that commence construction, modification, or reconstruction after September 18, 2015. This subpart also establishes emission standards and compliance schedules for the control of volatile organic compounds (VOC)

and sulfur dioxide (SO_2) emissions from affected facilities in the crude oil and natural gas source category that commence construction, modification, or reconstruction after September 18, 2015, and on or before December 6, 2022.

§ 60.5365a Am I subject to this subpart?

You are subject to the applicable provisions of this subpart if you are the owner or operator of one or more of the onshore affected facilities listed in paragraphs (a) through (j) of this section, that is located within the Crude Oil and Natural Gas source category, as defined in § 60.5430a, for which you commence construction, modification, or reconstruction after September 18, 2015, and on or before December 6, 2022. Facilities located inside and including the Local Distribution Company (LDC) custody transfer station are not subject to this subpart. An affected facility must continue to comply with the requirements of this subpart until it begins complying with a more stringent requirement, that applies to the same affected facility, in an approved, and effective, state or Federal plan that implements subpart OOOOc of this part, or modifies or reconstructs after December 6, 2022, and thus becomes subject to subpart OOOOb of this part.

40 CFR 60.5365a(i) states except as provided in § 60.5365a(i)(2), the collection of fugitive emissions components at a well site, as defined in § 60.5430a, is an affected facility.

Section 60.5430a, defines a fugitive emissions component as any component that has the potential to emit fugitive emissions of methane or VOC at a well site or compressor station, including valves, connectors, pressure relief devices, open-ended lines, flanges, covers and closed vent systems not subject to § 60.5411 or § 60.5411a, thief hatches or other openings on a controlled storage vessel not subject to § 60.5395 or § 60.5395a, compressors, instruments, and meters. Devices that vent as part of normal operations, such as natural gas-driven pneumatic controllers or natural gas-driven pumps, are not fugitive emissions components, insofar as the natural gas discharged from the device's vent is not considered a fugitive emission. Emissions originating from other than the device's vent, such as the thief hatch on a controlled storage vessel, would be considered fugitive emissions.

steam enhanced wells at TEOR operations contain multiple components that meet the definition of fugitive emission components (FEC) detailed in section 60.5430a. TEOR operations also operate as closed vent systems (CVS); thus, the requirements of FECs and CVSs that can be enforceable by BACT will be discussed.

§ 60.5397a What fugitive emissions GHG and VOC standards apply to the affected facility which is the collection of fugitive emissions components at a well site and the affected facility which is the collection of fugitive emissions components at a compressor station?

Paragraph (a) of this section requires the following:

1. All fugitive components must be monitored as accordance with paragraph (b) through (g) of this section.
2. Repairs must be performed in accordance with paragraph (h) of this section.
3. Records must be kept in accordance with paragraph (i) of this section
4. Reports must be made in accordance with paragraph (j) of this section.

This paragraph defines fugitives emissions as any visible emission from a fugitive emissions component observed using optical gas imaging or an instrument reading of 500 parts per million (ppm) or greater using Method 21 of appendix A-7 to this part.

Paragraph (e) states the following:

Each monitor survey shall observe each fugitive emissions component, as defined in 60.5430a, for fugitive emissions.

Paragraph (f) states the following:

1. Owner or operator must conduct an initial monitoring survey within 90 days of
   a. the startup of production for each collection of fugitive emissions components at new well site or by June 3, 2017, whichever is later.
   b. The startup of production for each collection of fugitive emissions components after the modification or by June 3, 2017, whichever is later
   c. The second portion of this paragraph only applies to well site located on the Alaskan North slope.
2. Owner or operator must conduct an initial monitoring survey within 90 days of Or by June 3, 2017 , whichever is later for
   a. Startup of a new compressor station for each collection of fugitive emissions components at the new compressor station.
   b. A modification collection of fugitive emissions components at a compressor station.
   c. The second portion of this paragraph only applies to well site located on the Alaskan North slope.

Paragraph (g) states the following:

A monitoring survey of each collection of fugitive emissions components at a well site or at a compressor station must be performed at the frequencies specified in paragraph (g)(1) and (2) of this section, with the exceptions noted in paragraphs (g)(3) through (6) of this section.

1. This paragraph ((g)(1)), requires a monitoring survey of each collection of fugitive emission components at a well site
   (i) be conducted at least semiannually after the initial survey.
   (ii) Be conducted at least 4 months apart and no more than 7 months apart.
   (iii) Alaskan north slope requirements that are less stringent.

2. This paragraph ((g)(2)), requires a monitoring survey of each collection of fugitive emission components at a compressor station
   (i) be conducted at least quarterly after the initial survey.
   (ii) Be conducted at least 60 days apart.
   (iii) Alaskan north slope requirements that are less stringent.
3. Fugitive Emission Components that can't be monitored without elevating the monitoring personnel more than 2 meters above the surface may be designated difficult-to-monitor (DtM). If designated DtM, specifications of (g)(3)(i) through (iv) must be met.
   (i) A written plan must be developed for all of the fugitive emissions components designated DtM. This written plan must be incorporated into the FEMP required by paragraphs (b), (c), and (d) of this section.
   (ii) Plan must include identification and location of each fugitive emissions component designated as DtM.
   (iii) Plan must include an explanation of why each fugitive emissions component designated as DtM is DtM.
   (iv) Plan must include a schedule for monitoring the DtM Fugitive emissions components at least once per calendar year.
4. Fugitive emission components (FECs) that cannot be monitored because monitoring personnel would be exposed to immediate danger while conducting a monitoring survey may be designated as unsafe-to-monitor (UtM). FECs that are designated UtM must meet the specifications of (g)(4)(i) through (iv) of this section.
   (i) A written plan must be developed for all of the FECs designated as UtM.
   (ii) Plan must include the identification and location of each FEC designated as UtM
   (iii) Plan must include an explanation of why each FEC designated as UtM is UtM.
   (iv) Plane must include a schedule for monitoring the fugitive emissions components designated as UtM.
5. No longer required to comply with (g)(1) of this section when the owner/operator removes all major production and processing equipment as defined in 60.5430a, such that the well site becomes a wellhead only well site. If any major production and processing equipment is subsequently added to the well site, then the owner/operator must comply with the requirements of (f)(1) and (g)(1) of this section.
6. Requirements of paragraph (g)(2) of this section are waived for any collection of FECs at a compressor station located within an area that has an average calendar month temperature below 0 F for two or three consecutive calendar months of a quarterly monitoring period. The calendar month temperature average for each month within the quarterly monitoring period must be determined using historical monthly average temperatures over the previous three years as reported by a national oceanic and atmospheric administration source or other source approved by the administrator. The requirements of (g)(2) of this section shall not be waived for two consecutive quarterly monitoring periods.

Paragraph (h) states the following:

Each identified source of fugitive emissions shall be repaired, as defined in 60.5430a, in accordance with (h)(1) and (2) of this section.

1. A first attempt at repair shall be made no later than 30 calendar days after detection of the fugitive emissions.
2. Repair shall be completed as soon as practicable, but no later than 30 calendar days after the first attempt at repair as required in (h)(1) of this section.
3. Delay of repair will be allowed if the conditions in (h)(3)(i) or (ii) of this section are met.
4. Each identified source of fugitive emissions must be resurveyed to complete repair according to the requirements in (h)(4)(i) through (iv)
    i. Operator may resurvey using method 21 of appendix A-7 or OGI.
    ii. For each repair that cannot be made during monitoring survey when fugitive emissions are initially found
        A. A digital photograph must be taken of that component or
            1. Must include the date of the photograph and
            2. clearly identify the component by location within the site
                a. e.g., the latitude and longitude of the component or by other descriptive landmarks visible in the picture
        B. The component must be tagged during the monitoring survey when the fugitive were initially found for identification purposes and subsequent repair.
    iii. Operators that use Method 21 of Appendix A-7 of this part to resurvey the repaired FECs are subject to the resurvey provisions specified in (h)(4)(iii)(A) and (B) of this section.
        A. A FEC is repaired when Method 21 instrument indicates a concentration of less than 500 ppm above background or when no soap bubbles are observed when the alternative screening procedures specified in section 8.3.3 of Method 21 of this part are used.
        B. Operators must use the MTHD 21 monitoring requirements specified in (c)(8)(ii) of this section or the alternative screening procedures specified in section 8.3.3 of Method 21 of this part.
    iv. Operators that use OGI to resurvey the repaired FECs, are subject to the resurvey provisions specified in (h)(4)(iv)(A) and (B) of this section.
        A. A FEC is repaired when the OGI instrument shows no indication of visible emissions.
        B. Operator must use the OGI monitoring requirements specified in (c)(7) of this section.

§ 60.5415a How do I demonstrate continuous compliance with the standards for my well, centrifugal compressor, reciprocating compressor, pneumatic controller,

pneumatic pump, storage vessel, collection of fugitive emissions components at a well site, and collection of fugitive emissions components at a compressor station affected facilities, equipment leaks at onshore natural gas processing plants and sweetening unit affected facilities?

Paragraph (h) of section 60.5415a also applies to FECs.

Paragraph (h) states the following:

1. For each collection of FECs at a well site and each collection of FECs at a compressor station, you must demonstrate continuous compliance with the fugitive emission standards specified in 60.5397a(a)(1) according to (h)(1) through (4) of this section.
    i. You must conduct periodic monitoring surveys as required in 60.5397a(g)
    ii. You must repair each identified source of fugitive emissions as required in 60.5397a(h).
    iii. You must maintain records as specified in 60.5420a(c)(15).
    iv. You must submit annual reports for collections of FECs at a well site and each collection of fugitive emissions components at a compressor station as required in 60.5420a(b)(1) and (7)

40 CFR Part 60 Subpart OOOOb - Standards of Performance for Crude Oil and Natural Gas Facilities for Which Construction, Modification, or Reconstruction Commenced After December 6, 2022

§ 60.5360b What is the purpose of this subpart?

(a) ***Scope.*** This subpart establishes emission standards and compliance schedules for the control of the pollutant greenhouse gases (GHG). The greenhouse gas standard in this subpart is in the form of a limitation on emissions of methane from affected facilities in the crude oil and natural gas source category that commence construction, modification, or reconstruction after December 6, 2022. This subpart also establishes emission standards and compliance schedules for the control of volatile organic compounds (VOC) and sulfur dioxide (SO_2) emissions from affected facilities in the crude oil and natural gas source category that commence construction, modification, or reconstruction after December 6, 2022.

§ 60.5365b Am I subject to this subpart?

You are subject to the applicable provisions of this subpart if you are the owner or operator of one or more of the onshore affected facilities listed in paragraphs (a) through (i) of this section, that is located within the Crude Oil and Natural Gas source category, as defined in § 60.5430b, for which you commence construction, modification, or reconstruction after December 6, 2022. Facilities located inside and including the Local Distribution Company (LDC) custody transfer station are not subject to this subpart.

40 CFR 60.5365b(i) states that equipment subject to this subpart includes each fugitive emissions components affected facility, which is the collection of fugitive emissions components at a well site, centralized production facility, or a compressor station.

Pursuant to Section 60.5430b, fugitive emissions component means any component that has the potential to emit fugitive emissions of methane or VOC at a well site, centralized production facility, or compressor station, such as valves (including separator dump valves), connectors, pressure relief devices, open-ended lines, flanges, covers and closed vent systems not subject to § 60.5411b, thief hatches or other openings on a storage vessel not subject to § 60.5395b, compressors, instruments, meters, and yard piping.

steam enhanced wells at TEOR operations contain multiple components that meet the definition of fugitive emission components detailed in section 60.5430b. TEOR operations also operate as closed vent systems (CVS); thus, the requirements of FECs and CVSs that can be enforceable by BACT will be discussed.

§ 60.5397b What GHG and VOC standards apply to fugitive emissions components affected facilities?

Section 60.5430b defines fugitive emissions for the purpose of this section, 60.5397b, as any indication of emissions observed from a fugitive emissions component using audible, visual, and olfactory (AVO) monitoring, an indication of visible emissions observed from an optical gas imaging (OGI) instrument, or an instrument reading of 500 ppmv or greater using Method 21 of appendix A-7 of this part.

Paragraph (a) of this section requires the following:

1. All fugitive components must be monitored as accordance with paragraph (b) through (g) of this section.
2. Repairs must be performed in accordance with paragraph (h) of this section.
3. Initial compliance must be demonstrated in accordance with paragraph (i) of this section
4. Records must be kept in accordance with paragraph (j) of this section
5. Reports must be made in accordance with paragraph (k) of this section.
6. Requirements for well closures must be met in accordance with paragraph (l) of this section.

Paragraph (e) states the following:

> Each monitor survey shall observe each fugitive emissions component, except buried yard piping and associated components (e.g., connectors), shall be observed or monitored for fugitive emissions during each monitoring survey.

Paragraph (f) states the following:

> You must conduct initial monitoring surveys according to the requirements specified in (f)(1) through (4) of this section.
>
> 3. Owner or operator for a modified or reconstructed FECs must conduct an initial monitoring survey within 90 days of
>   a. the startup of production for each collection of FECs affected facility or by June 6, 2024, whichever date is later.
>   b. The startup of production for each collection of fugitive emissions components after the modification or by June 3, 2017, whichever is later

Paragraph (g) states the following:

> A monitoring survey of each collection of FECs affected facility must be performed as specified in paragraph (g)(1), with the exceptions noted in (g)(2) through (4) of this section. Monitoring for FECs affected facilities located at well sites and centralized production facilities that have wells located onsite must

continue at the specified frequencies in (g)(1)(i), (ii), (iii), (iv) and (vi) of this section until the well closure requirements of paragraph (l) of this section are completed.

1. This paragraph ((g)(1)), requires a monitoring survey of each collection of fugitive emission components at a well site
   (i) be conducted at least quarterly using AVO, or any other detection method, after the initial survey except as specified in (g)(1)(vi). Any indications of fugitive emissions using these methods are considered fugitive emissions that must be repaired in accordance with (h) of this section.
   (ii) A monitoring survey of FEC affected facilities located at small well sites must be conducted at least quarterly using AVO, or any other detection method, after the initial survey except as specified in (g)(1)(vi) of this section. Any indications of fugitive emissions using these methods are considered fugitive emissions that must be repaired in accordance with paragraph (h) of this section.

   (iii) A monitoring survey of the fugitive emissions components affected facilities located at multi-wellhead only well sites must be conducted in accordance with (g)(1)(iii)(A) and (B) of this section, except as specified in (g)(1)(vi)
      A. A monitoring survey must be conducted at least quarterly using AVO, or any other detection method, after the initial survey. Any indications of fugitive emissions using these methods are considered fugitive emissions that must be repaired in accordance with paragraph (h) of this section.
      B. A monitoring survey must be conducted at least semiannually using OGI or Method 21 of appendix A-7 to this part after the initial survey. Consecutive semiannual surveys must be conducted at least 4 months apart and no more than 7 months apart.
   (iv) A monitoring survey of FECs affected facilities located at well sites or centralized production facilities that contain the major production and processing equipment specified in (g)(1)(iv)(A), (B), (C), or (D) must be conducted at the frequencies in (g)(1)(iv)(E) and (F) of this section, except as specified in (g)(1)(vi) of this section.
      A. One or more controlled storage vessels or tank batteries.
      B. One or more control devices.
      C. One or more natural gas-driven process controllers or pumps.
      D. Two or more pieces of major production and processing equipment not specified in (g)(1(iv)(A) through (C) of this section.
      E. A monitoring survey must be conducted at least bimonthly using AVO, or any other detection method, after the initial survey. Any indications of fugitive emission using these methods are considered fugitive emissions that must be repaired in accordance with paragraph (h) of this section.

F. A monitoring survey must be conducted at least quarterly using OGI or Method 21 of appendix A-7 to this part after the initial survey. Consecutive quarterly monitoring surveys must be conducted at least 60 calendar days apart.

(v) A monitoring survey of FECs affected facility located at a compressor station must be conducted at the frequencies in (g)(1)(v)(A) and (B) of this section, except as specified in (g)(1)(vi) of this section,

A. A monitoring survey must be conducted at least monthly using AVO, or any other detection method, after the initial survey. Any indications of fugitive emissions using these methods are considered fugitive emissions that must be repaired in accordance with paragraph (h) of this section.

B. A monitoring survey must be conducted at least quarterly using OGI or Method 21 of appendix A-7 to this part after the initial survey. Consecutive quarterly monitoring surveys must be conducted at least 60 calendar days apart.

Paragraph (h) states the following:

Each identified source of fugitive emissions shall be repaired, in accordance with (h)(1) and (2) of this section.

1. A first attempt at repair shall be made in accordance with (h)(1)(i) and (ii) of this section.
   i. no later than 15 calendar days after detection of the fugitive emissions using AVO.
   ii. If you are complying with paragraphs (g)(1)(i) through (vi) using OGI or method 21, a first attempt shall at repair shall be made no later than 30 calendar days after detection of the fugitive emissions.
2. Repair shall be completed as soon as practicable, but no later than 15 calendar days after the first attempt at repair as required in (h)(1)(i) of this section, and 30 calendar days after the first attempt at repair as required by (h)(1)(ii).
3. Delay of repair will be allowed if the conditions in (h)(3)(i) or (ii) of this section are met.
   i. Technically infeasible, vent blowdown, compressor station shutdown, well shutdown or shut-in, or UtR during operation, repaired must be completed during the next scheduled maintenance or shutdown event.
   ii. If the repair requires replacement of a fugitive emissions component or a part thereof, but the replacement cannot be acquired and installed within the repair timelines specified in (h)(1) and (2) of this section due to either of the conditions specified in (h)(3)(ii)(A) or (B) of this section, the repair must be completed in accordance with (h)(3)(ii)(C) of this section and documented in accordance with 60.5420b(c)(14)(v)(l).
      A. Valve assembly supplies had been sufficiently stocked but are depleted at the time of the required repair.

B. A replacement fugitive emissions component or a part thereof requires custom fabrication
C. The required replacement must be ordered no later than 10 calendar days after the first attempt at repair. The repair must be completed as soon as practicable, but no later than 30 calendar days after receipt of the replacement component, unless the repair requires a compressor station or well shutdown. If the repair requires a compressor station or well shutdown the repair must be completed in accordance with the timeframe specified in (h)(3)(i) of this section.

4. Each identified source of fugitive emissions must be resurveyed to complete repair according to the requirements in (h)(4)(i) through (v)
   i. Operator may resurvey using method 21 of appendix A-7 or OGI. Except as specified in (h)(4)(v) of this section.
   ii. For each repair that cannot be made during monitoring survey when fugitive emissions are initially found
      A. A digital photograph must be taken of that component or
         1. Must include the date of the photograph and
         2. clearly identify the component by location within the site
            a. e.g., the latitude and longitude of the component or by other descriptive landmarks visible in the picture
      B. The component must be tagged during the monitoring survey when the fugitive were initially found for identification purposes and subsequent repair.
   iii. Operators that use Method 21 of Appendix A-7 of this part to resurvey the repaired FECs are subject to the resurvey provisions specified in (h)(4)(iii)(A) and (B) of this section.
      A. A FEC is repaired when Method 21 instrument indicates a concentration of less than 500 ppm above background or when no soap bubbles are observed when the alternative screening procedures specified in section 8.3.3 of Method 21 of this part are used.
      B. Operators must use the MTHD 21 monitoring requirements specified in (c)(8)(ii) of this section or the alternative screening procedures specified in section 8.3.3 of Method 21 of this part.
   iv. Operators that use OGI to resurvey the repaired FECs, are subject to the resurvey provisions specified in (h)(4)(iv)(A) and (B) of this section.
      A. A FEC is repaired when the OGI instrument shows no indication of visible emissions.
      B. Operator must use the OGI monitoring requirements specified in (c)(7) of this section.

Paragraph (i) states the following:

1. Records for each monitoring survey shall be maintained as specified in 605420a©(15)

§ 60.5415b How do I demonstrate continuous compliance with the standards for each of my affected facilities?

Paragraph (l) of section 60.5415b also applies to FECs.

Paragraph (l) states the following:

1. For each FECs affected facility, you must demonstrate continuous compliance with the fugitive emission standards specified in 60.5397b(a)(1) according to (l)(1) through (4) of this section.
   i. You must conduct periodic monitoring surveys as required in 60.5397b(e) and (g).
   ii. You must repair each identified source of fugitive emissions as required in 60.5397b(h).
   iii. You must submit annual reports for collections of FECs at a well site and each collection of fugitive emissions components at a compressor station as required in 60.5420b(b)(1) and (9)
   iv. You must maintain records as specified in 60.5420b(c)(14).

§ 60.5416b What are the initial and continuous cover and closed vent system inspection and monitoring requirements?

For each closed vent system (CVS) and cover at your well, centrifugal compressor, reciprocating compressor, process controller, pump, storage vessel, and process unit equipment affect facilities, you must comply with the applicable requirements of paragraph (a) and (c) of this section.

(a). If you install a control device or route emissions to a process, you must inspect each closed vent system according to the procedures and schedule specified in (a)(1) and (2) of this section, inspect each cover according to the procedures and schedule specified in (a)(3) of this section, and inspect each bypass device according to the procedures of paragraph (a)(4) of this section, except as provide in paragraphs (b)(7) and (8) of this section.
   (1). For each closed vent system joint, seam, or other connect that is permanently or semi permanently sealed (a welded joint or a bolted and gasketed ducting flange), the requirements specified in (a)(1)(i) through (iii) of this section must be met.
      (i). Within the first 30 calendar days after January 22, 2027, or upon startup of the affected facility routing emissions through the closed vent system, whichever is later, conduct an initial inspection according to the test methods and procedures specified in (b) of this section to demonstrate that the closed vent system operates with no identifiable emissions.
      (ii). Conduct AVO inspections in accordance with and at the same frequency as specified for FECs affected facilities located at the

sample type of site as specified in 60.5397b(g). Process unit equipment affected facilities must conduct annual AVO inspections concurrent with the inspections required by (a)(1)(ii) of this section.

(2). For CVS components other than those specified in (a)(1) of this section, you must meet the requirements of (a)(2)(i) through (iv) of this section.

(i). Conduct an initial inspection according to the test methods and procedures specified in (b) of this section w/in the first 30 calendar days after startup of the affected facility routing emissions through the CVS or January 22, 2027, whichever is later, to demonstrate that the CVS operates with no identifiable emissions.

(ii). Beginning January 22, 2027, conduct inspections according to the test methods, procedures, and frequencies specified in (b) of this section to demonstrate that the components or connections operate with no identifiable emissions.

(iii). Conduct annual visual inspections for defects that could result in air emissions. Beginning January 22, 2027, you must monitor a component or connection using the test methods and procedures of (b) of this section to demonstrate that it operates with no identifiable emissions following any time the component is repaired or replaced or the connection is unsealed.

1. Defects include but are not limited to:
   a. Visible cracks
   b. Holes, or
   c. Gaps in ductwork;
   d. Loose connections;
   e. Liquid leaks, or
   f. Broken or missing caps
   g. Or other closure devices.

(iv). Conduct AVO inspections in accordance with and at the same frequency as specified for FECs affected facilities located at the same type of site, as specified in 60.5397b(g). Process unit equipment affected facilities must conduct annual AVO inspections concurrent with the inspections required by (a)(2)(iii) of this section.

(3). For each cover you must meet the requirements of (a)(3)(i) through (iv) of this section.

(i). Beginning January 22, 2027, conduct the inspections specified in (a)(3)(ii) through (iv) of this section to identify defects that could result in air emissions and to ensure the cover operates with no identifiable emissions. Defects include, but are not limited to, visible cracks, holes, or gaps in the cover, or between the cover and the separator wall; broken, cracked, or otherwise damaged seals or gaskets on closure devices; and

broken or missing hatches, access covers, caps, or other closure devices. In the case where the storage vessel is buried partially or entirely underground, you must inspect only those portions of the cover that extend to or above the ground surface, and those connections that are on such portions of the cover and can be opened to the atmosphere.

1. Example of connections are
   a. Fill ports,
   b. Access hatches, gauge wells,
   c. Etc.

(ii). An initial inspection according to the test methods and procedures specified in (b) of this section, following installation of the cover to demonstrate that each cover operates with no identifiable emissions.

(iii). Conduct AVO inspections in accordance with and at the same frequency as specified for fugitive emissions components affected facilities located at the same type of site as specified in 60.5397b(g). Process unit equipment affected facilities must conduct annual AVO inspections concurrent with the inspections required by (a)(1)(ii) of this section.

(iv). Inspections according to the test methods, procedures, and schedules specified in (b) of this section to demonstrate that each cover operates with no identifiable emissions.

(4). For each bypass device, except as provided for in 60.5411b(a)(4)(ii), you must meet the requirements of (a)(4)(i) or (ii) of this section.

(i). Set the flow indicator to take a reading at least once every 15 minutes at the inlet to the bypass device that could divert the stream away from the control device and to the atmosphere.

(ii). If the bypass device valve installed at the inlet to the bypass device is secured in the non-diverting position using a car-seal or a lock-and-key type configuration, visually inspect the seal or closure mechanism at least once every month to verify that the valve is maintained in the non-diverting position and the vent stream is not diverted through the bypass device.

(b). **[No identifiable emission test methods and procedures.]** If you are required to conduct an inspection of a CVS and cover as specified in (a)(1), (2), or (3) of this section or 60.5398b(b), you must meet the requirements of paragraphs (b)(1) through (9) of this section after January 22, 2027. You must meet the requirements of (b)(1), (2), (4) and (9) of this section for each self-contained process controller at your process controlled affected facility as specified at 60.5390b(a)(2).

Paragraphs (b)(1) through (4) of this section have similar requirements to test method and procedures for FECs. The only difference is that the test methods used should not detect any emissions from the CVS.

(5). **Repairs.** Whenever emissions or a defect is detected, you must repair the emission or defects as soon as practicable according to the requirements of (b)(5)(i) through (iii) of this section, except as provided in (b)(6) of this section.
(i). A first attempt at repair must be made no later than 5 calendar days after the emissions or defect is detected.
(ii). Repair must be complete no later than 30 calendar after the emissions or defect is detected.
(iii). For covers, grease or another substance compatible with the gasket material must be applied to deteriorating or cracked gaskets to improve the seal while awaiting repair.

Paragraphs (b)(7) and (8) have similar requirements to that of the FECs.

Records and reports. You must maintain records of all inspection results as specified in 60.5420b(c)(8) through (10). You must submit the reports as specified in 60.5420b(b)(11).

40 CFR Part 60 Subpart OOOOc – Emissions Guidelines for Greenhouse Gas Emissions From Existing Crude Oil and Natural Gas Facilities

§ 60.5360c What is the purpose of this subpart?

This subpart establishes emission guidelines and compliance schedules for the control of greenhouse gas (GHG) emissions from designated facilities in the crude oil and natural gas source category as defined in the Model Rule at § 60.5430c, in accordance with section 111(d) of the Clean Air Act and subpart Ba of this part. The designated facilities, standards section reference and compliance dates are listed in table 1 to this subpart. To the extent any requirement of this subpart is inconsistent with the requirements of subpart A or Ba of this part, the requirements of this subpart will apply.

§ 60.5362c Am I affected by this subpart?

(a) If you are the Administrator of an air pollution control agency in a state or United States protectorate with one or more designated facilities that commenced construction, modification, or reconstruction on or before December 6, 2022, you must submit a state or Tribal plan to the U.S. Environmental Protection Agency (EPA) that implements the emission guidelines contained in this subpart. The submission of such plan shall be made in electronic format according to subpart Ba of this part.
(b) If you are the Administrator of an air pollution control agency in a state or United States protectorate with no designated facilities for which construction commenced on or before December 6, 2022, you must submit a negative declaration letter in place of

the state or Tribal plan. The submission of such negative declaration letter shall be made in electronic format according to subpart Ba of this part.
(c) You must submit the state or Tribal plan or negative declaration letter to EPA by January 22, 2027.

Although the plans need to be submitted by a state or tribal government, the requirements of this subpart may be applicable to TEOR operations.

§ 60.5386c Am I subject to this subpart?

You are subject to the applicable provisions of this subpart if you are the owner or operator of one or more of the onshore designated facilities listed in paragraphs (a) through (h) of this section, that is located within the Crude Oil and Natural Gas source category, as defined in § 60.5430c, for which you commence construction, modification, or reconstruction on or before December 6, 2022. Facilities located inside and including the Local Distribution Company (LDC) custody transfer station are not subject to this subpart.

40 CFR 60.5386c(h) states that equipment subject to this subpart includes each fugitive emissions components designated facility, which is the collection of fugitive emissions components at a well site, centralized production facility, or a compressor station.

§ 60.5397c What GHG standards apply to fugitive emissions components designated facilities?

Section 60.5430c defines fugitive emissions for the purpose of this section, 60.5397c, as any indication of emissions observed from a fugitive emissions component using audible, visual, and olfactory (AVO) monitoring, an indication of visible emissions observed from an optical gas imaging (OGI) instrument, or an instrument reading of 500 ppmv or greater using Method 21 of appendix A-7 of this part.

This section applies to FECs designated facilities. Requirements of (a) through (l) of this section must be complied with to reduce fugitive emissions of methane. Requirements of this section are independent of the cover and closed vent system (CVS) requirements of 60.5411c.

Paragraph (a) of this section requires the following:

1. All fugitive components must be monitored as accordance with paragraph (b) through (g) of this section.
2. Repairs must be performed in accordance with paragraph (h) of this section.
3. Initial compliance must be demonstrated in accordance with paragraph (i) of this section
4. Records must be kept in accordance with paragraph (j) of this section
5. Reports must be made in accordance with paragraph (k) of this section.

6. Requirements for well closures must be met in accordance with paragraph (l) of this section.

Paragraph (e) states the following:

Each monitor survey shall observe each fugitive emissions component, except buried yard piping and associated components (e.g., connectors), shall be observed or monitored for fugitive emissions during each monitoring survey.

Paragraph (f) states the following:

You must conduct initial monitoring surveys according to the requirements specified in (f)(1) through (4) of this section.

1. Owner or operator of a FECs at a single wellhead only site and small sites, must conduct an initial monitoring survey within 90 days of
   a. the startup of production for each collection of FECs affected facility or by 90 days after the state plan submittal deadline, whichever date is later.
2. multi-wellhead only well sites, well sites or centralized production facilities
   a. you must conduct an initial monitoring survey using OGI or Method 21 to appendix A-7 to this part within 90 days of the effective date of your state or Tribal plan, for each fugitive emissions components designated facility, or by 36 months after the state plan submittal deadline (as specified in § 60.5362c(c)), whichever date is later.

Paragraph (g) states the following:

A monitoring survey of each collection of FECs designated facility must be performed as specified in paragraph (g)(1), with the exceptions noted in (g)(2) through (4) of this section. Monitoring for FECs affected facilities located at well sites and centralized production facilities that have wells located onsite must continue at the specified frequencies in (g)(1)(i), (ii), (iii), (iv) and (vi) of this section until the well closure requirements of paragraph (l) of this section are completed.

1. This paragraph ((g)(1)), requires a monitoring survey of each collection of fugitive emission components at a well site
   (i) be conducted at least quarterly using AVO, or any other detection method, after the initial survey except as specified in (g)(1)(vi). Any indications of fugitive emissions using these methods are considered fugitive emissions that must be repaired in accordance with (h) of this section.
   (ii) A monitoring survey of FEC affected facilities located at small well sites must be conducted at least quarterly using AVO, or any other detection method, after the initial survey except as specified in (g)(1)(vi) of this section. Any indications of fugitive emissions using these methods are considered fugitive emissions that must be repaired in accordance with paragraph (h) of this section.

(iii) A monitoring survey of the fugitive emissions components affected facilities located at multi-wellhead only well sites must be conducted in accordance with (g)(1)(iii)(A) and (B) of this section, except as specified in (g)(1)(vi)
   A. A monitoring survey must be conducted at least quarterly using AVO, or any other detection method, after the initial survey. Any indications of fugitive emissions using these methods are considered fugitive emissions that must be repaired in accordance with paragraph (h) of this section.
   B. A monitoring survey must be conducted at least semiannually using OGI or Method 21 of appendix A-7 to this part after the initial survey. Consecutive semiannual surveys must be conducted at least 4 months apart and no more than 7 months apart.

(iv) A monitoring survey of FECs affected facilities located at well sites or centralized production facilities that contain the major production and processing equipment specified in (g)(1)(iv)(A), (B), (C), or (D) must be conducted at the frequencies in (g)(1)(iv)(E) and (F) of this section, except as specified in (g)(1)(vi) of this section.
   A. One or more controlled storage vessels or tank batteries.
   B. One or more control devices.
   C. One or more natural gas-driven process controllers or pumps.
   D. Two or more pieces of major production and processing equipment not specified in (g)(1(iv)(A) through (C) of this section.
   E. A monitoring survey must be conducted at least bimonthly using AVO, or any other detection method, after the initial survey. Any indications of fugitive emission using these methods are considered fugitive emissions that must be repaired in accordance with paragraph (h) of this section.
   F. A monitoring survey must be conducted at least quarterly using OGI or Method 21 of appendix A-7 to this part after the initial survey. Consecutive quarterly monitoring surveys must be conducted at least 60 calendar days apart.

(v) A monitoring survey of FECs affected facility located at a compressor station must be conducted at the frequencies in (g)(1)(v)(A) and (B) of this section, except as specified in (g)(1)(vi) of this section,
   A. A monitoring survey must be conducted at least monthly using AVO, or any other detection method, after the initial survey. Any indications of fugitive emissions using these methods are considered fugitive emissions that must be repaired in accordance with paragraph (h) of this section.
   B. A monitoring survey must be conducted at least quarterly using OGI or Method 21 of appendix A-7 to this part after the initial survey. Consecutive quarterly monitoring surveys must be conducted at least 60 calendar days apart.

(2) requirements for difficult to monitor designated FECs.

(3) requirements for unsafe to monitor designated FECs.

Paragraph (h) states the following:

Each identified source of fugitive emissions shall be repaired, in accordance with (h)(1) and (2) of this section.

1. A first attempt at repair shall be made in accordance with (h)(1)(i) and (ii) of this section.
   i. no later than 15 calendar days after detection of the fugitive emissions using AVO.
   ii. If you are complying with paragraphs (g)(1)(i) through (vi) using OGI or method 21, a first attempt shall at repair shall be made no later than 30 calendar days after detection of the fugitive emissions.
2. Repair shall be completed as soon as practicable, but no later than 15 calendar days after the first attempt at repair as required in (h)(1)(i) of this section, and 30 calendar days after the first attempt at repair as required by (h)(1)(ii).
3. Delay of repair will be allowed if the conditions in (h)(3)(i) or (ii) of this section are met.
   i. Technically infeasible, vent blowdown, compressor station shutdown, well shutdown or shut-in, or UtR during operation, repaired must be completed during the next scheduled maintenance or shutdown event.
   ii. If the repair requires replacement of a fugitive emissions component or a part thereof, but the replacement cannot be acquired and installed within the repair timelines specified in (h)(1) and (2) of this section due to either of the conditions specified in (h)(3)(ii)(A) or (B) of this section, the repair must be completed in accordance with (h)(3)(ii)(C) of this section and documented in accordance with 60.5420b(c)(14)(v)(l).
      A. Valve assembly supplies had been sufficiently stocked but are depleted at the time of the required repair.
      B. A replacement fugitive emissions component or a part thereof requires custom fabrication
      C. The required replacement must be ordered no later than 10 calendar days after the first attempt at repair. The repair must be completed as soon as practicable, but no later than 30 calendar days after receipt of the replacement component, unless the repair requires a compressor station or well shutdown. If the repair requires a compressor station or well shutdown the repair must be completed in accordance with the timeframe specified in (h)(3)(i) o this section.

4. Each identified source of fugitive emissions must be resurveyed to complete repair according to the requirements in (h)(4)(i) through (v)

i. Operator may resurvey using method 21 of appendix A-7 or OGI. Except as specified in (h)(4)(v) of this section.
ii. For each repair that cannot be made during monitoring survey when fugitive emissions are initially found
    A. A digital photograph must be taken of that component or
        1. Must include the date of the photograph and
        2. clearly identify the component by location within the site
            a. e.g., the latitude and longitude of the component or by other descriptive landmarks visible in the picture
    B. The component must be tagged during the monitoring survey when the fugitive were initially found for identification purposes and subsequent repair.
iii. Operators that use Method 21 of Appendix A-7 of this part to resurvey the repaired FECs are subject to the resurvey provisions specified in (h)(4)(iii)(A) and (B) of this section.
    A. A FEC is repaired when Method 21 instrument indicates a concentration of less than 500 ppm above background or when no soap bubbles are observed when the alternative screening procedures specified in section 8.3.3 of Method 21 of this part are used.
    B. Operators must use the MTHD 21 monitoring requirements specified in (c)(8)(ii) of this section or the alternative screening procedures specified in section 8.3.3 of Method 21 of this part.
iv. Operators that use OGI to resurvey the repaired FECs, are subject to the resurvey provisions specified in (h)(4)(iv)(A) and (B) of this section.
    A. A FEC is repaired when the OGI instrument shows no indication of visible emissions.
    B. Operator must use the OGI monitoring requirements specified in (c)(7) of this section.
v. For fugitive emissions identified using AVO detection methods, the operator may resurvey using those same methods, Method 21 of appendix A-7 to this part, or OGI. For operators that use AVO detection methods, a fugitive emissions component is repaired when there are no indications of fugitive emissions using these methods.

Paragraph (i) states the following:

Records for each monitoring survey shall be maintained as specified in 605410(c)(i)

Paragraph (j) states the following:

You must demonstrate continuous compliance with the standards that apply to fugitive emissions components designated facilities as required by § 60.5415c(j).

§ 60.5410c How do I demonstrate initial compliance with the standards for each of my designated facilities?

Paragraph (l) of section 60.5410c applies to FECs.

Paragraph (l) states the following:

1. For each FECs affected facility, you must demonstrate initial compliance with the fugitive emission standards specified in 60.5397c according to (i)(1) through (5) of this section.
   i. You must develop a FEMP plan as required by 60.5397c (b), (c), and (d).
   ii. You must conduct an initial monitoring survey as required in 60.5397c (e) and (f).
   iii. You must repair each identified source of fugitive emissions for each designated facility as required in 60.5397c(h).
   iv. You must submit the initial annual report for each fugitive emissions components designated facility as required in 60.5420c(b)(1) and (8).
   v. You must maintain the records specified in 60.5420c(c)(13).

§ 60.5411c What additional requirements must I meet to determine initial compliance for my covers and closed vent systems?

For each closed vent system (CVS) and cover at your well, centrifugal compressor, reciprocating compressor, process controller, pump, storage vessel, and process unit equipment affect facilities, you must comply with the applicable requirements of paragraph (a) and (c) of this section.

(a). Close vent system requirements.
   (1). Must design the CVS to capture and route all gases, vapors, and fumes to a process.
   (2). This is requirements for gas wells. TEOR wells are for oil production, thus this section does not apply.
   (3). You must design and operate the CVS with no identifiable emissions as demonstrated by 60.5416c(a) and (b).
   (4). For bypass devices must meet the requirements specified in (a)(4)(i) and (ii) of this section if the CVS contains one or more bypass devices that could be used to divert all or a portion of the gases, vapors, or fumes from entering the control device or being routed to a process.
      (i). Except as provided in (a)(4)(ii) of this section, you must comply with either (a)(4)(i)(A) or (B) of this section for each bypass device

(b). Cover requirements for storage vessels, centrifugal compressors and reciprocating compressors. Not applicable to BACT discussion.

(c). Design requirements.

   (1). Must assess that the CVS is of sufficient design and capacity to ensure all gases, vapors and fumes from the designated facility are routed to the control device or process and that the control device or process are of

sufficient design and capacity to accommodate all emissions from the designated facility.

(i). Requirements of certification for design from a professional engineer or in-house engineer with expertise on the design and operation.

(ii). The assessment shall be prepared under the direction or supervision of a qualified professional engineer or an in-house engineer who signs the certification in paragraph (c)(1)(i) of this section.

§ 60.5415c How do I demonstrate continuous compliance with the standards for each of my designated facilities?

Paragraph (j) of section 60.5415c also applies to FECs.

Paragraph (j) states the following:

For each FECs affected facility, you must demonstrate continuous compliance with the fugitive emission standards specified in 60.5397c(a) according to (j)(1) through (4) of this section.

(1) You must conduct periodic monitoring surveys as required in 60.5397c(e) and (g).

(2) You must repair each identified source of fugitive emissions as required in 60.5397c(h).

(3) You must submit annual reports for collections of FECs at a well site and each collection of fugitive emissions components at a compressor station as required in 60.5420c(b)(1) and (9)

(4) You must maintain records as specified in 60.5420c(c)(13).

§ 60.5416c What are the initial and continuous cover and closed vent system inspection and monitoring requirements?

Section 60.5430c defines “no identifiable emissions” for the purposes of covers, closed vent systems, and self-contained natural gas-driven process controllers and as determined according to the provisions of § 60.5416c, that no emissions are detected by AVO means when inspections are conducted by AVO; no emissions are imaged with an OGI camera when inspections are conducted with OGI; and equipment is operating with an instrument reading of less than 500 ppmv above background, as determined by Method 21 of appendix A-7 to this part when inspections are conducted with Method 21.

For each closed vent system (CVS) and cover at your well, centrifugal compressor, reciprocating compressor, process controller, pump, storage vessel, and process unit equipment affect facilities, you must comply with the applicable requirements of paragraph (a) and (c) of this section.

(a).If you install a control device or route emissions to a process, you must inspect each closed vent system according to the procedures and schedule specified in (a)(1) and (2) of this section, inspect each cover according to the

procedures and schedule specified in (a)(3) of this section, and inspect each bypass device according to the procedures of paragraph (a)(4) of this section, except as provided in paragraphs (b)(7) and (8) of this section.

(1). For each closed vent system joint, seam, or other connect that is permanently or semi permanently sealed (a welded joint or a bolted and gasketed ducting flange), the requirements specified in (a)(1)(i) through (iii) of this section must be met.

(i). conduct an initial inspection according to the test methods and procedures specified in (b) of this section to demonstrate that the CVS operates with no identifiable emissions within the first 30 calendar days after routing emissions through the CVS.

(ii). Conduct annual visual inspections for defects that could result in air emissions. Defects include, but are not limited to, visible cracks, holes, or gaps in piping; loose connections; liquid leaks; or broken or missing caps or other closure devices. You must monitor a component or connection using the test methods and procedures in paragraph (b) of this section to demonstrate that it operates with no identifiable emissions following any time the component is repaired or replaced or the connection is unsealed.

(iii). Conduct AVO inspections in accordance with and at the same frequency as specified for FECs affected facilities located at the sample type of site as specified in 60.5397c(g). Process unit equipment affected facilities must conduct annual AVO inspections concurrent with the inspections required by (a)(1)(ii) of this section.

(2). For CVS components other than those specified in (a)(1) of this section, you must meet the requirements of (a)(2)(i) through (iv) of this section.

(i). Conduct an initial inspection according to the test methods and procedures specified in (b) of this section w/in the first 30 calendar days after routing emissions through the CVS to demonstrate that the CVS operates with no identifiable emissions.

(ii). conduct inspections according to the test methods, procedures, and frequencies specified in (b) of this section to demonstrate that the components or connections operate with no identifiable emissions.

(iii). Conduct annual visual inspections for defects that could result in air emissions. you must monitor a component or connection using the test methods and procedures of (b) of this section to demonstrate that it operates with no identifiable emissions following any time the component is repaired or replaced or the connection is unsealed.

1. Defects include but are not limited to:
   a. Visible cracks
   b. Holes, or
   c. Gaps in ductwork;
   d. Loose connections;
   e. Liquid leaks, or
   f. Broken or missing caps

g. Or other closure devices.

(iv). Conduct AVO inspections in accordance with and at the same frequency as specified for FECs designated facilities located at the same type of site, as specified in 60.5397b(g). Process unit equipment affected facilities must conduct annual AVO inspections concurrent with the inspections required by (a)(2)(iii) of this section.

(3). For each cover you must meet the requirements of (a)(3)(i) through (iv) of this section.

(i). conduct the inspections specified in (a)(3)(ii) through (iv) of this section to identify defects that could result in air emissions and to ensure the cover operates with no identifiable emissions. Defects include, but are not limited to, visible cracks, holes, or gaps in the cover, or between the cover and the separator wall; broken, cracked, or otherwise damaged seals or gaskets on closure devices; and broken or missing hatches, access covers, caps, or other closure devices. In the case where the storage vessel is buried partially or entirely underground, you must inspect only those portions of the cover that extend to or above the ground surface, and those connections that are on such portions of the cover and can be opened to the atmosphere.

1. Example of connections are
   a. Fill ports,
   b. Access hatches, gauge wells,
   c. Etc.

(ii). An initial inspection according to the test methods and procedures specified in (b) of this section, following installation of the cover to demonstrate that each cover operates with no identifiable emissions

(iii). Conduct AVO inspections in accordance with and at the same frequency as specified for fugitive emissions components affected facilities located at the same type of site as specified in 60.5397b(g). Process unit equipment affected facilities must conduct annual AVO inspections concurrent with the inspections required by (a)(1)(ii) of this section.

(iv). Inspections according to the test methods, procedures, and schedules specified in (b) of this section to demonstrate that each cover operates with no identifiable emissions.

(4). For each bypass device, except as provided for in 60.5411b(a)(4)(ii), you must meet the requirements of (a)(4)(i) or (ii) of this section.

(i). Set the flow indicator to take a reading at least once every 15 minutes at the inlet to the bypass device that could divert the stream away from the control device and to the atmosphere.

(ii). If the bypass device valve installed at the inlet to the bypass device is secured in the non-diverting position using a car-seal or a lock-and-key type configuration, visually inspect the seal or closure mechanism at least once every month to verify that the valve is maintained in the

non-diverting position and the vent stream is not diverted through the bypass device.

(b). **[No identifiable emission test methods and procedures.]** If you are required to conduct an inspection of a CVS and cover as specified in (a)(1), (2), or (3) of this section or 60.5398c(b), you must meet the requirements of paragraphs (b)(1) through (9) of this section. You must meet the requirements of (b)(1), (2), (4) and (9) of this section for each self-contained process controller at your process controller affected facility as specified at 60.5390b(a)(2).

Paragraphs (b)(1) through (4) of this section have similar requirements to test method and procedures for FECs. The only difference is that the test method used should not detect any emissions from the CVS.

(5). **Repairs.** Whenever emissions or a defect is detected, you must repair the emission or defects as soon as practicable according to the requirements of (b)(5)(i) through (iii) of this section, except as provided in (b)(6) of this section.

(i). A first attempt at repair must be made no later than 5 calendar days after the emissions or defect is detected.

(ii). Repair must be complete no later than 30 calendar after the emissions or defect is detected.

(iii). For covers, grease or another substance compatible with the gasket material must be applied to deteriorating or cracked gaskets to improve the seal while awaiting repair.

(6). **Delay of repair.** Delays of repaired of a CVS or cover for which emissions or defects have been detected can be delayed if the repair is technically infeasible without a shutdown, or if you determine that emission resulting from immediate repair would be greater than the emission likely to result from delay of repair. You must complete repair of such equipment by the end of the next shutdown.

Paragraphs (b)(7) and (8) have similar requirements to that of the FECs.

(8). **Records and reports.** You must maintain records of all inspection results as specified in 60.5420b(c)(7) through (9). You must submit the reports as specified in 60.5420c(b)(10).

Summary of Applicable Rules and Subparts

Achieved in Practice

Based on the above information, the following options can be considered achieved in practice BACT emissions limitation for thermally enhanced oil recovery – steam enhanced crude oil production wells:

VOC:

(SCAQMD Rule 1173, SJVAPCD Rule 4401 and Subpart OOOOc) defect[1] and leak[2] inspection of all accessible and operating pumps, compressors, and PRDs in service at least once each calendar week via Audio-Visual-olfactory (AVO) or Optical gas imaging (OGI).

(District Rule 4401 and Subpart OOOOc) Upon detection of emissions or defect using AVO/OGI:

a. First repair – immediately after the emission or defect is detected.
b. Repair completion – pursuant to applicable repair requirements of District Rule 4401.

All other leak detection and repair program meeting the requirements of Rule 4401

Technologically Feasible

There are no technologically feasible options listed in any applicable district rule or any subpart.

Alternate Basic Equipment

There are no alternate basic equipment options listed in any applicable district rule or any subpart.

C. Summary of Permitted Sources:

A review of the District's permit database shows that there are a significant amount of TEOR operations which transfer vapors to gas pipeline or re-inject to formations and are subject to a leak detection and repair program meeting the requirements of Rule 4401.

[1] as defined in 40 CFR 60.5416c(a)(2)(iii)
[2] as defined in Table 2 of South Coast AQMD Rule 1173 (11/01/24)

Step 1 – Identify all possible control Technologies

Summary of Permit Requirements to Establish the Achieved in Practice BACT Standard:

Achieved in Practice

VOC:

Vapor control system with transfer of vapors to gas pipeline or re-injection to formation. Fugitive defect and leak inspection via Audio-Visual-olfactory (AVO) or Optical gas imaging (OGI) inspections once each calendar week. Upon detection of emissions or defect using AVO/OGI: First repair – immediately after the emission or defect is detected; Repair completion – pursuant to applicable repair requirements of District Rule 4401. All other leak detection and repair program meeting the requirements of Rule 4401.

Technologically Feasible

SO_X:

SO_X scrubber with 95% sulfur removal or sulfur compounds reduced to no more than 1 gr S/100 dscf

Alternate Basic Equipment

SO_X:

Vapor control system with either transfer of vapors to gas pipeline or re-injection to formation

Step 2 - Eliminate Technologically Infeasible Options

There are no technologically infeasible options listed in Step 1. All of the emission control options under consideration are based on either current BACT requirements, current rule requirements, or current subpart requirements. Therefore, no further discussion is required.

Step 3 - Rank Remaining Control Technologies by Control effectiveness

The following control technologies have been identified and are ranked based on stringency:

SO_X:

1. SO_X scrubber with 95% sulfur removal or sulfur compounds reduced to no more than 1 gr S/100 dscf (Tech Feasible)

2. Vapor control system with either transfer of vapors to gas pipeline or re-injection to formation (Alternate Basic Equipment)

VOC:

1. Vapor control system with transfer of vapors to gas pipeline or re-injection to formation. Fugitive defect and leak inspection via Audio-Visual-olfactory (AVO) or Optical gas imaging (OGI) inspections once each calendar week. Upon detection of emissions or defect using AVO/OGI: First repair – immediately after the emission or defect is detected; Repair completion – pursuant to applicable repair requirements of District Rule 4401. All other leak detection and repair program meeting the requirements of Rule 4401. (Achieved in Practice)

Step 4 - Cost Effectiveness Analysis

This BACT analysis is being performed as a proactive update to this BACT guideline and is not part of a specific permitting action. Therefore, a cost effectiveness analysis is not necessary and will not be included as part of this analysis.

Step 5 - Select BACT

This is a proactive determination that is not part of a specific permitting action. Therefore, selecting BACT is not necessary. However, the following emission control standard has been determined to be achieved in practice and is therefore determined to be the minimum BACT for Thermally Enhanced Oil Recovery – Steam Enhanced Crude Oil Production Wells:

VOC:

1. Vapor control system with transfer of vapors to gas pipeline or re-injection to formation. Fugitive defect and leak inspection via Audio-Visual-olfactory (AVO) or Optical gas imaging (OGI) inspections once each calendar week. Upon detection of emissions or defect using AVO/OGI: First repair – immediately after the emission or defect is detected; Repair completion – pursuant to applicable repair requirements of District Rule 4401. All other leak detection and repair program meeting the requirements of Rule 4401. (Achieved in Practice)

V. Recommendation

Adopt the recommended draft BACT guideline.

Appendix
Appendix A: Current BACT Guideline 7.1.1
Appendix B: Proposed Revised Draft BACT Guideline 7.1.1

Appendix A
Current BACT Guideline 7.1.1

San Joaquin Valley
Unified Air Pollution Control District

Best Available Control Technology (BACT) Guideline 7.1.1

Emissions Unit: Steam Enhanced Crude Oil Production Wells
Industry Type: Oil and Gas
Equipment Rating: All
Last Update: 12/30/2020

Pollutant	Achieved in Practice or contained in SIP	Technologically Feasible	Alternate Basic Equipment
VOC	Vapor control system and leak detection and repair program meeting the requirements of Rule 4401.		Vapor control system with transfer of vapors to gas pipeline or re-injection to formation and leak detection and repair program meeting the requirements of Rule 4401.
SO_x		SO_x scrubber with 95% sulfur removal or sulfur compounds reduced to no more than 1 gr S/100 dscf	Vapor control system with either transfer vapors to gas pipeline or re-injection to formation

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

Appendix B
Proposed Revised Draft BACT Guideline 7.1.1

San Joaquin Valley
Unified Air Pollution Control District

Best Available Control Technology (BACT) Guideline 7.1.1

Emissions Unit: Steam Enhanced Crude Oil Production Wells
Industry Type: Oil and Gas
Equipment Rating: all
Last Update: April 7, 2026

Pollutant	Achieved in Practice or contained in SIP	Technologically Feasible	Alternate Basic Equipment
VOC	Vapor control system with transfer of vapors to gas pipeline or re-injection to formation. Fugitive defect* and leak** inspection via Audio-Visual-olfactory (AVO) or Optical gas imaging (OGI) inspections once each calendar week. Upon detection of emission or defect using AVO/OGI: First repair – immediately after the emission or defect is detected; Repair completion – pursuant to applicable repair requirements of District Rule 4401. All other leak detection and repair program meeting the requirements of Rule 4401.		
SO_x		SO_x scrubber with 95% sulfur removal or sulfur compounds reduced to no more than 1 gr S/100 dscf	Vapor control system with either transfer of vapors to gas pipeline or re-injection to formation

* as defined in 40 CFR 60.5416c(a)(2)(iii)
** as defined in Table 2 of South Coast AQMD Rule 1173 (11/01/24)

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