

**MONTEREY BAY
AIR RESOURCES DISTRICT**

PROPOSED STAFF REPORT



Proposed Rule:

Rule 441 (Boilers, Steam Generators, And Process Heaters)

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Monterey Bay
Air Resources District

RICHARD A. STEDMAN
Air Pollution Control Officer

Prepared By:
Amy Clymo
Mary Giraudo
Armando Jimenez
Seong Heon Kim

24580 Silver Cloud Court
Monterey, CA 94930
Main Phone Number: (831) 647-9411
www.mbard.org

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1. Summary

1.1 Introduction

The Monterey Bay Air Resources District (MBARD) is designated nonattainment for the state 8-hour ozone standard and per California Health and Safety Code Section (CH&SC) 40920.6(c) must adopt an expedited BARCT schedule for creating or updating rules. Thus, MBARD is proposing to create Rule 441, Boilers, Steam Generators, and Process Heaters. Rule 441 will address controlling oxides of nitrogen (NO_x) and carbon monoxide (CO) emissions from boilers, steam generators, and process heaters at subject sources per CH&SC Section 40920.6(c)(2).

The proposed Rule 441 will not have a significant or detrimental effect on the environment. The rule will require existing equipment to meet lower emission limits at four specific industrial sources. Therefore, staff will prepare and submit a Notice of Exemption to satisfy the requirements of the California Environmental Quality Act (CEQA). The notice will state that the adoption of Rule 441 is exempt from the requirements of CEQA pursuant to Title 14, California Code of Regulations, Section 15308, Actions by Regulatory Agencies for Protection of the Environment.

1.2 Background

Assembly Bill 617 (AB 617) was approved on July 26, 2017 and amends CH&SC Division 26, Part 3, Chapter 10, Section 40920.6. AB 617 requires each air district that is a nonattainment area for one or more air pollutants to adopt, by January 1, 2019, an expedited schedule for implementation of best available retrofit control technology (BARCT) by the earliest feasible date, but no later than December 31, 2023. This requirement applies to each industrial source subject to California Greenhouse Gas (GHG) Cap-and-Trade requirements. Within the jurisdiction of MBARD, there are four industrial sources subject to the BARCT schedule: Aera Energy, LLC, Chevron U.S.A. Inc., Eagle Petroleum, LLC, and Lhoist North America of Arizona, Inc. MBARD reviewed the permitted emission sources at these facilities and developed a list of potential rule development activities to implement BARCT by the deadline of December 31, 2023.

On October 15, 2018, MBARD’s Board of Directors approved the proposed BARCT schedule as shown in Table 1 below.

To fulfill Table 1 of the BARCT schedule, staff is proposing to adopt Rule 441.

Table 1. Expedited BARCT Implementation Schedule

Rule Development Sources	2019	2020	2021	2022	2023
Steam Generators/ Boilers/Process Heaters	■	■	■		
Internal Combustion Engines		■	■	■	
Steam Driven Oil Production Wells (revise Rule 427)			■	■	■
Lime Kiln				■	■

1.3 Public Review

As part of MBARD's rule development procedures, MBARD will send the rule adoption announcement to interested parties, post the announcement on our website, hold a public workshop, and review the rule with MBARD's Advisory Committee prior to taking the proposed rule to the Board of Directors for adoption. The proposed rule was publically noticed on our website on November 25, 2019 and public meetings will be held as shown below.

Activity	Date/Time	Where
Advisory Committee Meeting	December 05, 2019, 1:30 PM	MBARD Board Room 24580 Silver Cloud Ct., Monterey
Public Workshop	January 15, 2020, 10 AM	MBARD Board Room 24580 Silver Cloud Ct., Monterey
Board Adoption	February 19, 2020, 1:30 PM	MBARD Board Room 24580 Silver Cloud Ct., Monterey

Public comments were received from Chevron and Aera Energy, LLC. The comments are included in Attachment A and MBARD's responses are included in Attachment B. The changes to Rule 441 made based on the comments are shown in Attachment C.

1.4 California Environmental Quality Act (CEQA) Analysis

California Public Resource Code Section 21159 requires MBARD to perform an environmental analysis of the reasonably foreseeable methods of compliance at the time of adopting a rule requiring the installation of pollution control equipment or a performance standard. The analysis must include the following information.

1. An analysis of the reasonably foreseeable environmental impacts of the methods of compliance.
2. An analysis of the reasonably foreseeable mitigation measures.
3. An analysis of the reasonably foreseeable alternative means of compliance with the rule or regulation.

The proposed Rule 441 will reduce NO_x emissions from existing boilers, process heaters, and steam generators. The proposed rule does not create new requirements that may have an adverse effect on the environment. MBARD is proposing the rule to comply with the requirements of CH&SC 40920.6(c)(2) to implement a BARCT schedule, there are no alternatives in the Health and Safety Code for MBARD to meet this requirement. Finally, the emission standards that are proposed have been in place in other air districts for the last 15 years, and there are a number of manufacturers that can supply equipment that complies with the proposed rule. Thus, pursuant to state CEQA guidelines, MBARD finds the adoption of the proposed rule to be exempt from CEQA under Class 8

2. Discussion of Proposed Rule 441 Requirements

This chapter describes the proposed elements of Rule 441.

2.1 Part 1. General

This part of the rule discusses the purpose, applicability, exemptions, and effective date of Rule 441. The purpose of this Rule is to control NO_x emissions from boilers, steam generators, and process heaters at subject sources per CH&SC Section 40920.6(c)(2). Exemptions to the rule have been added for certain units, and an exemption from the emission standards of Section 3.1 of the Rule have been added for units using less than 90,000 therms or 9 billion BTU in any calendar year, units operating during curtailment conditions, non-operational units, and for units that provide emission reduction credits per Rule 215 in lieu of meeting the emission standards. Staff anticipates the effective date of this rule to be February 19, 2020.

2.2 Part 2 Definitions

Definitions were added to this rule to help clarify the rule requirements.

2.3 Part 3 Standards

This part of the rule presents the NO_x and CO emission requirements for subject AB 617 industrial units and performance testing required to demonstrate compliance with the emission limits. Tables 2 and 3 below summarize these requirements:

Table 2. Proposed BARCT Emission Limits

Source Category	Total Unit Rated Heat Input/Description (MMBTU/hr)	Fuel	NO _x Limit (ppmv @ 3% O ₂)	CO Limit (ppmv @ 3% O ₂)
Boilers & Process Heaters	≥ 2 to < 5	Gaseous	30	400
	≥ 5 to < 20		15	400
	≥ 20		9	400
Oilfield Steam Generators	≥ 2	Gaseous	15	400

Table 3. Performance Testing Requirements

Section	Source Category	Total Unit Rated Heat Input/Description (MMBTU/hr)	Testing Method & Frequency
3.4.1	Boiler & Process Heaters	≥ 2 to < 5	Portable analyzer test at least once every calendar year
3.4.2		≥ 5 to < 20	
3.4.3		≥ 20	Source test at least once every calendar year
3.4.4	Oilfield Steam Generator	≥ 2	Source test at least once every calendar year

This part of the rule also discusses the requirements of the owners or operators of units claiming the low-use exemption.

2.4 Administrative Requirements

This part of the rule discusses the reporting requirements for the tune-up and source test reports, as well the compliance requirements when a unit loses the low-fuel usage exemption. Lastly, it also presents the compliance schedule to meet the emission requirements of this rule.

2.5 Recordkeeping and Test Methods

This part of the rule discusses the recordkeeping requirements for each of the units subject to the rule and the approved test methods to demonstrate compliance with the emission requirements.

3. Rule Comparison

CH&SC Section 40727.2 requires districts to prepare a written analysis that identifies all existing federal air pollution control requirements, including, but not limited to, emission control standards constituting best available control technology (BACT) that apply to the same equipment or source type as the rule or regulation proposed for adoption or modification by MBARD. In addition, the analysis shall identify any other District rule or regulation that applies to the same equipment or source type.

Rule 441 applies to boilers, steam generators, and process heaters except for certain units that are entirely exempt from the rule. Units subject to Rule 441 may be subject to the requirements of New Source Performance Standards (NSPS) contained in Title 40, Code of Federal Regulations, Part 60 (40 CFR Part 60) Subpart D, Db, and Dc depending on their rated heat inputs and the date upon which the unit was constructed, modified, or reconstructed. Units subject to Rule 441 may also be

subject to the requirements of National Emission Standards for Hazardous Air Pollutants (NESHAP) contained in 40 CFR Part 63 Subparts DDDDD and JJJJJ depending upon whether a unit is located at a major or area source of Hazardous Air Pollutants (HAP). A comparison of MBARD's proposed Rule 441 to the existing federal regulations is shown below in Table 4. Staff also compared Rule 441 to the rules adopted by other nearby air districts. A comparison of MBARD's proposed Rule 441 to other nearby air district rules is shown below in Tables 5 and 6.

As shown in Table 4 below, the Rule 441 requirements are more stringent than federal regulations. However, as shown in Tables 5 and 6, the proposed rule is not requiring any provisions that are more stringent than what has already been adopted by other air districts. Furthermore, Rule 441 was written to be consistent with other air districts while still adequately acknowledging the specific industrial sources in the region covered by MBARD.

Table 4. Comparison of Rule 441 Requirements with Federal Regulations

Rule Number	MBARD Rule 441	40 CFR Part 60 Subpart D	40 CFR Part 60 Subpart Db	40 CFR Part 60 Subpart Dc	40 CFR Part 63 Subpart DDDDD	40 CFR Part 63 Subpart JJJJJ
<u>NO_x Emission Limits</u>	Highest Limit equates to 30 ppm or 0.0365 lb/MMBTU	Lowest limit is 0.20 lb/MMBTU	Lowest limit is 0.10 lb/MMBTU	No NO _x limit in the regulation	No NO _x limit in the regulation	No NO _x limit in the regulation
<u>CO Emission Limits</u>	400 ppm or 0.2960 lb/MMBTU	0.15 lb/MMBTU limit for certain sources	0.15 lb/MMBTU limit for certain sources	0.15 lb/MMBTU limit for certain sources	Lowest CO limits are 130 ppm and 150 ppm ^b	420 ppm as 3-run average or 10-day rolling average
<u>Testing</u>	Portable analyzer test ^c and source test ^d at least once every calendar year.	Initial test plus CEMS & COMS at most	Initial test plus CEMS & COMS at most	Initial test plus CEMS & COMS at most	Initial test plus CEMS & COMS at most	Initial test plus CEMS & COMS at most
<u>Usage Monitoring</u>	Monthly records of fuel usage and operating hours	Fuel usage records not required	Daily or monthly records of fuel usage	Daily or monthly records of fuel usage	Daily or monthly records of fuel usage	Daily or monthly records of fuel usage
<u>Recordkeeping</u>	5 years	No record retention period specified	2 years	2 years	5 years	5 years

a. In this regulations, compliance with CO limit is one requirement for sources that elect not to install and operate a Continuous Opacity Monitoring (COMS).

b. The 130 ppm limit is the lowest limit for any category of emissions unit for which compliance is determined by the average of three test runs and the 150 ppm limit is the lowest limit for a unit in any category that is equipped with a Continuous Emissions Monitoring System (CEMS) determined as a 30-day rolling average.

c. Portable analyzer test only required for boilers and process heaters that have a total heat input rate between 2 - 20 MMBTU/hr.

d. Sources test only required for boilers and process heaters that have a total heat input rate greater than or equal to 20 MMBTU/hr and for oilfield steam generators.

Table 5. Comparison of Rule 441 to Nearby Air Districts (≥2 to 5 MMBTU/Hr)

Air District and Rule Number		MBARD Rule 441 (Proposed)	Santa Barbara APCD Rule 361 (2019)	San Luis Obispo APCD Rule 430 (2014)	San Joaquin Valley APCD Rule 4307 (2008)	Bay Area AQMD Regulation 9 Rule 7 (2011)
Section	Rule Component					
<u>Applicability</u>	MMBtu/hr	≥2	2 - 5	NA	2 - 5	2 - 5
<u>Exemptions</u>	Curtailment	Yes - 200 hours	Yes - 168 hours	NA	Yes - 168 hours	---
	Low-Fuel Usage	Yes - 90,000 therms/yr	Yes - 1.8 billion BTUs/yr or 18,000 therms/yr	NA	---	Yes - 90,000 therms/yr
	Startups & Shutdown	Yes	Yes	NA	Yes	Yes
<u>NO_x Emission Limits</u>	NG - non atmospheric	30 ppm limit for subject sources	9 ppm	NA	9 ppm or 0.011 lb/MMBTU	30 ppm
	NG - atmospheric	30 ppm limit for subject sources	12 ppm	NA	12 ppm or 0.014 lb/MMBTU	---
	FG - non atmospheric	---	9 ppm	NA	9 ppm or 0.011 lb/MMBTU	---
	FG - atmospheric	---	12 ppm	NA	12 ppm or 0.014 lb/MMBTU	---
	Oilfield Steam Generator	15 ppm	---	NA	---	---
	Landfill Gas	---	25 ppm	NA	---	30 ppm
	Digester Gas	---	15 ppm	NA	---	30 ppm
	LPG/Propane	---	20 ppm	NA	---	30 ppm
<u>Testing</u>	Source Test	None	Natural Gas: none All others: none	NA	When installed or modified, if not certified	Annual
	Tune-up	Low-Use: Annual	Natural Gas: Semiannual All others: none	NA	Semiannual	Low-use: Annual
	NO _x Analyzer	Annual	During Tune-ups	NA	May be performed in lieu of tune-up	May be performed in lieu of source test
<u>Recordkeeping</u>	Record Duration	5 years	5 years	NA	5 years	2 years

Table 6. Comparison of Rule 441 to Nearby Air Districts (≥ 5 MMBTU/Hr)

Air District and Rule Number		MBARD Rule 441 (Proposed)	Santa Barbara APCD Rule 342 (2019)	San Luis Obispo APCD Rule 430 (2014)	San Joaquin Valley APCD Rule 4320 (2008)	Bay Area AQMD Regulation 9 Rule 7 (2011)
Section	Rule Component					
Applicability	MMBtu/hr	5+	5+	5+	5+	5+
Exemptions	Curtailment	Yes - 200 hours	Yes - 168 hours	Yes	Yes - 168 hours	---
	Low-Fuel Usage	Yes - 90,000 therms/yr	Yes - 90,000 therms/yr	Yes - 90,000 therms/yr	---	Yes - 90,000 therms/yr
	Startups & Shutdown	Yes	Yes	Yes	Yes	Yes
NO_x Emission Limits	Gaseous (NG/FG/LPG): 5-20 MMBtu/hr	15 ppm limit for subject sources	9 ppm	30 ppm	9 ppm	15 ppm
	Gaseous (NG/FG/LPG): 20+ MMBtu/hr	9 ppm limit for subject sources	7 ppm	30 ppm	7 ppm	20 +, load-following unit: 15 ppm 20-75 MMBtu/hr: 9 ppm 75+ MMBtu/hr: 5 ppm
	Oilfield Steam Generator	15 ppm	---	---	15 ppm	---
	Landfill Gas	---	25 ppm	30 ppm	---	30 ppm
	Digester Gas	---	15 ppm	30 ppm	9 ppm	30 ppm
	Nongaseous	---	40 ppm	40 ppm	40 ppm	40 ppm
Testing	Source Test	≥ 20 MMBTU/hr: Annual Oilfield Steam Generator: Annual	Every 2 years	When installed or modified	Every 1-3 years	Gaseous/Landfill/Digester: Every calendar year Non-gaseous: Within 60-days
	Tune-up	Low-use: Annual	Low-use: Annual	Low-use: Annual	Semiannual	Low-use: Annual
	NO _x Analyzer	---	---	---	Monthly operating parameter check	---
Recordkeeping	Record Duration	5 years	5 years	3 years	5 years	2 years

4. Cost Implications

Pursuant to CH&SC Section §40920.6, prior to adopting rules or regulations to meet the requirement for best available retrofit control technology, MBARD shall review the information developed to assess the cost-effectiveness of the potential control options. “Cost-effectiveness” means the cost, in dollars, of the potential control option divided by emission reduction potential, in tons, of the potential control option. In addition, MBARD shall calculate the incremental cost-effectiveness for the potential control options. To determine the incremental cost-effectiveness under this paragraph, MBARD shall calculate the difference in the dollar costs divided by the difference in the emission reduction potentials between each progressively more stringent potential control option as compared to the next less expensive control option. A more detailed discussion of control options was included in MBARD’s BARCT Schedule Report.¹

Emission Impacts

To identify the emission impacts of the rule, MBARD first needed to identify the applicable units that may get emission reductions under the proposed rule. The emission reductions come from natural gas fired boilers, process heaters, and oilfield steam generators. Accordingly, staff queried MBARD’s permit database to evaluate how many existing units already comply with the proposed NO_x limits and how many units may need to meet the NO_x limits of Rule 441. The results of MBARD’s permit database query are shown in Table 7 below.

Table 7. Number of Units Subject to Rule 441

MMBTU/hr Range	# Low NO_x Units	#Higher Emitting Units	Total Units
2 - 5	0	1	1
5 - 20	0	15	15
20+	24	24	48
		Total Units	64

The emissions reductions will be based upon the permitted emissions levels, however, staff understands that in practice, the units do not operate at full capacity. Thus, to quantify the emission reductions from the higher-emitting units an operating capacity factor of 75% and 50% were chosen as a conservative estimate to quantify the emission reductions from the higher-emitting units. Using these assumptions, the estimated emissions reductions for each size range are shown in Table 8 below.

¹ Monterey Bay Air Resources District BARCT Schedule Report (October 15, 2018).

Table 8. Estimated Emission Reductions from Rule 441

MMBTU/hr Range	#Higher Emitting Units	Emission Reduction (ton/yr)	Emission Reduction of 75% Operation (ton/yr)	Emission Reduction of 50% Operation (ton/yr)
2 - 5	1	1	1	0.37
5 - 20	15	33	25	16
20+	24	1,356	1,017	678
Total Reductions:		1,390	1,043	694

The anticipated emission reductions from the proposed rule, excluding units qualifying for the low-use exemption, is calculated to be approximately 694 to 1,390 tons of NO_x per year depending on the operating capacity factor of these units. The NO_x emission reductions from the proposed rule will occur gradually as units are retrofitted or replaced with newer, low NO_x units. Overall, it is reasonable to assume that over the course of implementation of Rule 441, all units subject to the rule will be replaced in a linear fashion.

MBARD’s NO_x emission inventory from the Air Quality Management Plan² reports daily NO_x emissions from all sources in 2020 of 31.61 tons per day. The sources of emissions include stationary, area, and mobile sources. The NO_x reductions anticipated from Rule 441 equates to a reduction of approximately 2 tons per day from the stationary source category. Additional emission reductions help MBARD to continue to meet the federal ambient air quality standard for ozone and come closer to attaining the state ambient air quality standard for ozone

Cost Effectiveness

The proposed rule will require units subject to Rule 441 to meet the NO_x and CO limits of Section 3.1. The cost impact was analyzed for:

1. Cost of retrofitting or replacing the existing unit;
2. Cost of differential of installing new compliant units;
3. Cost for fuel meter and equipment tuning, and
4. Authority to Construct and Permit to Operate modification fee.

The following assumptions and formulas were used for calculating the absolute cost effectiveness of lowering the NO_x emission limits.

1. Annualized Compliance Cost (ACC)

² Monterey Bay Air Resources District 2012 – 2015 Air Quality Management Plan (March 15, 2017).

$$ACC = Cost \times Capital Recovery Factor (CRF)$$

$$2. CRF = \frac{i(1+i)^n}{(1+i)^n - 1} = \frac{0.04(1+0.04)^{10}}{(1+0.04)^{10} - 1} = 0.123$$

Where: i = interest rate (4%)

n = equipment life (assume 10 years for low-NO_x/ultra low-NO_x burners, assume 20 years for Selective-Non Catalyst Reduction (SNCR), and assume 25 years for Selective Catalytic Reduction (SCR))

Tables 9 & 10 below present the details for the cost of installing Ultra Low NO_x Burners (ULNB) on current oilfield steam generators to achieve the 15 ppmv NO_x emission level. The detailed analyses include the estimated costs for installed capital equipment, electricity, fuel, and operations and maintenance based upon data from other air district's staff reports.^{3,4} MBARD evaluated the emissions reduced from these units at different operating capacity factors. Oilfield steam generators typically operate at around 75% capacity.⁵ For conservative measures, MBARD also evaluated these units at 50% capacity. Both analyses found that installing ULNB for units rated between 25 and 62.5 MMBTU/Hr to be cost effective.

Table 9. ULNB Cost Effectiveness Calculation for Units At 75% Capacity Factor (Retrofit to 15 ppmv NO_x at 3% O₂)

MMBTU/hr Range	Capital Cost	Installation Cost	Annualized Capital Cost	Incremental Operation	Annualized Cost	NO _x Reduced (tons/yr)	Cost Effectiveness (\$/ton)
25 ^a	\$780,000	\$520,000	\$160,278	\$5,000	\$165,278	9.41	\$17,564
30 ^{a,c}	\$112,523	\$23,749	\$16,801	\$10,699	\$27,500	1.79	\$15,363
60 ^a	\$900,000	\$600,000	\$184,936	\$12,000	\$196,936	70.32	\$2,800
62.5 ^a	\$900,000	\$600,000	\$184,936	\$14,500	\$199,436	40.72	\$4,897
62.5 ^b	\$2,160,000	\$896,400	\$376,826	\$14,500	\$391,326	37.31	\$10,488

a. Units fired on PUC quality gas.

b. Units fired on non-PUC quality gas.

c. This unit is currently permitted to have a 30 ppmv NO_x limit, and the cost data for this unit to achieve 15 ppmv NO_x was referenced from San Joaquin Valley Unified Air Pollution Control District, Appendix C, Cost Effectiveness Analysis For Proposed Amendments To Rule 4306 and Rule 4307 and Proposed New Rule 4320 (August 21, 2008). The values referenced in this document were adjusted for inflation.

³ San Joaquin Valley Unified Air Pollution Control District, Appendix C, Cost Effectiveness Analysis For Proposed Amendments To Rule 4306 and Rule 4307 and Proposed New Rule 4320 (August 21, 2008).

⁴ Santa Barbara Air County Air Pollution Control District Staff Report for Rule 361 and 342 (May 13, 2019).

⁵ San Joaquin Valley Unified Air Pollution Control District, Appendix C, Cost Effectiveness Analysis For Proposed Amendments To Rule 4306 and Rule 4307 and Proposed New Rule 4320 (August 21, 2008).

Table 10. ULNB Cost Effectiveness Calculation for Units At 50% Capacity Factor (Retrofit to 15 ppmv NO_x at 3% O₂)

MMBTU/hr Range	Capital Cost	Installation Cost	Annualized Capital Cost	Incremental Operation	Annualized Cost	NO _x Reduced (tons/yr)	Cost Effectiveness (\$/ton)
25 ^a	\$780,000	\$520,000	\$160,278	\$5,000	\$165,278	6.28	\$26,318
30 ^{a,c}	\$112,523	\$23,749	\$16,801	\$10,699	\$27,500	1.2	\$22,916
60 ^a	\$900,000	\$600,000	\$184,936	\$12,000	\$196,936	46.8	\$4,208
62.5 ^a	\$900,000	\$600,000	\$184,936	\$14,500	\$199,436	27.14	\$7,348
62.5 ^b	\$2,160,000	\$896,400	\$376,826	\$14,500	\$391,326	24.87	\$15,734

a. Units fired on PUC quality gas.

b. Units fired on non-PUC quality gas.

c. This unit is currently permitted to have a 30 ppmv NO_x limit, and the cost data for this unit to achieve 15 ppmv NO_x was referenced from San Joaquin Valley Unified Air Pollution Control District, Appendix C, Cost Effectiveness Analysis For Proposed Amendments To Rule 4306 and Rule 4307 and Proposed New Rule 4320 (August 21, 2008). The values referenced in this document were adjusted for inflation.

Tables 11 & 12 below present the details for the cost of installing ULNB on current boilers, heater treaters, and process heaters to reach the 15 ppmv NO_x emission level. The detailed analyses include the estimated costs for installed capital equipment, electricity, fuel, and operations and maintenance based upon data from other Air District’s staff report. MBARD evaluated the emissions reduced from these units at three different operating capacity factor 75% and 50%. All analyses determine that installing ULNB for units rated between 2.7 and 8.4 to be cost effective.

Table 11. ULNB Cost Effectiveness Calculation for Units At 75% Capacity Factor (Retrofit to 15 ppmv NO_x at 3% O₂)

MMBTU/hr Range	Capital Cost	Installation Cost	Annualized Capital Cost	Incremental Operation	Annualized Cost	NO _x Reduced (tons/yr)	Cost Effectiveness (\$/ton)
2.7	\$54,000	\$13,500	\$8,322	\$540	\$8,862	0.55	\$16,112
4.8	\$108,000	\$21,600	\$15,978	\$960	\$16,938	1.26	\$13,443
6	\$108,000	\$21,600	\$15,978	\$1,200	\$17,178	1.58	\$10,872
7	\$108,000	\$21,600	\$15,978	\$1,400	\$17,378	1.84	\$9,444
8.4	\$108,000	\$21,600	\$15,978	\$1,680	\$17,658	2.21	\$7,990

Table 12. ULNB Cost Effectiveness Calculation for Units At 50% Capacity Factor (Retrofit to 15 ppmv NO_x at 3% O₂)

MMBTU/hr Range	Capital Cost	Installation Cost	Annualized Capital Cost	Incremental Operation	Annualized Cost	NO _x Reduced (tons/yr)	Cost Effectiveness (\$/ton)
2.7	\$54,000	\$13,500	\$8,322	\$540	\$8,862	0.37	\$23,951
4.8	\$108,000	\$21,600	\$15,978	\$960	\$16,938	0.84	\$20,164
6	\$108,000	\$21,600	\$15,978	\$1,200	\$17,178	1.05	\$16,360
7	\$108,000	\$21,600	\$15,978	\$1,400	\$17,378	1.23	\$14,128
8.4	\$108,000	\$21,600	\$15,978	\$1,680	\$17,658	1.47	\$12,012

Incremental Cost Effectiveness

CH&SC 40920.6 require an assessment of the incremental cost-effectiveness for proposed regulations relative to ozone, carbon monoxide (CO), oxides of sulfur (SO_x), oxides of nitrogen (NO_x), and their precursors. Incremental cost-effectiveness is defined as the difference in control costs divided by the difference in emission reductions between two potential control options that can achieve the same emission reduction goal of a regulation. The incremental cost-effectiveness is the difference in cost between two successively more effective controls, divided by the additional emission reductions achieved. The equation is shown below:

$$\frac{IC \left(\frac{\$}{ton} \right)}{E} = \left(\frac{CC_{option2} - CC_{option1}}{ER_{option2} - ER_{option1}} \right)$$

Where: IC=Incremental Cost(\$)

E=-Emission reduction(tons)

CC_{option2}=Control costs for option 2 (\$/yr)

CC_{option1}=Control costs for option 1 (\$/yr)

ER_{option2}=Emission reductions for option 2 (tons)

ER_{option1}=Emission reductions for option 1 (tons)

MBARD reviewed the incremental cost-effectiveness between adding low NO_x burners to comply with the proposed 15 ppmvd @ 3% O₂ NO_x standard and adding selective catalytic reduction (SCR) to achieve 5 ppmvd @ 3% O₂ NO_x standard. The use of SCR involves injecting aqueous ammonia into the exhaust stream, in which the ammonia reacts with the flue gas over a catalyst to reduce the NO_x in nitrogen gas, water vapor, and carbon dioxide. Installation and maintenance costs of SCR systems are quite expensive, with preliminary cost estimates exceeding \$50,000/ton of NO_x reduced.⁶ Thus, when comparing alternative technologies available for achieving NO_x reductions for boilers, process heaters, and steam generators, the most cost-effective means to meet the emission limit is installing low NO_x burners.

⁶ Santa Barbara Air County Air Pollution Control District Staff Report for Rule 361 and 342 (May 13, 2019).

Fiscal Impact Upon Industrial Sources

The proposed rule would require the four applicable industrial sources to incur costs to retrofit or replace equipment to meet the NO_x emission limits.

Fiscal Impact Upon District

Adopting the new Rule 441 would be consistent with the proposed budget for fiscal year 2019-2020 which includes revenue from an AB 617 grant received from CARB to implement the BARCT schedule. Therefore, staff does not anticipate any fiscal impact upon MBARD.

Socioeconomic Effects

CH&SC 40728.5(a) requires MBARD, in the process of the adoption of any rule or regulation, to consider the socioeconomic impact if air quality or emissions limits may be significantly affected. However, pursuant to Section 40728.5(e), upon approval by a majority vote of MBARD board, a district is not required to include the analyses specified in paragraphs (2) and (4) of subdivision (b) in any assessment of socioeconomic impact for any rule or regulation that only adopts a requirement that is required by, a state or federal statute, regulation, or applicable formal guidance document. On October 15, 2018, MBARD's Board of Director approved the rule development for boilers, steam generators, and heaters to comply with the requirements set forth in CH&SC Division 26, Part 3, Chapter 10, Section 40920.6. Therefore, only the information specified in paragraphs (1), (5), and (6) of subdivision (b) of CH&SC Section 40728.5 will be included in the socioeconomic analysis for this rulemaking.

1. The type of industries or business, including small business, affected by the rule or regulation will be sources subject to the California GHG Cap-and-Trade requirements as of January 1, 2017. In the MBARD jurisdiction, these industries are oil and gas facilities and a lime kiln processing facility.
2. The emission reduction potential of the rule is estimated to be about 694 to 1,390 tons per year of NO_x.
3. MBARD is currently designated as nonattainment for the state 8-hour ozone standard and 24-hour particulate matter less than 10 microns (PM₁₀) standard. The adoption of Rule 441 is necessary to comply with the requirements set forth in AB 617 as described in CH&SC 40920.6(c). This section requires MBARD to implement a Best Available Retrofit Control Technology (BARCT) schedule which includes addressing NO_x emissions from boilers, steamer generators, and process heaters. BARCT is an emission limitation that is based on maximum degree of reduction achievable, taking into account environmental, energy, and economic impacts by each class or category of sources. NO_x emissions are considered ozone precursors, and the purpose of Rule 441 is to reduce emissions of NO_x from boilers, steam generators, and process heaters. Therefore, the adoption of Rule 441 is necessary to help achieve attainment for the state 8-hour ozone standard.

5. Regulatory Findings

CH&SC Section 40727(a) requires that prior to adopting or amending a rule or regulation, an air district's Board make findings of necessity, authority, clarity, consistency, non-duplication, and reference. The findings must be based on the following:

1. Information presented in the written analysis, prepared pursuant to CH&SC 40727.2;
2. Information contained in the rulemaking records pursuant to 40728; and
3. Relevant information presented at the Board's hearing for adoption of the rule.

The required findings are:

Necessity: It is necessary for MBARD to adopt this rule in order to comply with our obligations pursuant to CH&SC Section 40920.6(c). The additional NO_x emissions reduced through the rule requirements will help MBARD in our effort to attain the state 8-hour ozone standard.

Authority: MBARD is authorized to adopt rules and regulations by CH&SC Sections 40001, 40702, 40716.

Clarity: The proposed rule is written so that the meaning can be easily understood by the industrial sources directly affected by the rule. In addition, the record contains no evidence that the industrial sources directly affected by the rule cannot understand the rule.

Consistency: The proposed rule does not conflict with and is not contradictory to existing statutes, court decisions, or state or federal regulations. As stated above, MBARD wrote the rule to be consistent with similar rules in other air districts.

Non-Duplication: The proposed rule does not duplicate any state laws or regulations regarding attainment and maintenance of state and federal air quality standards.

Reference: The District must refer to any statute, court decision, or other provision of law that MBARD implements, interprets, or makes specific by adopting, amending, or repealing the rule.

6. References

1. Bay Area Air Quality Management District – Regulation 9 Rule 7 (Nitrogen Oxides and Carbon Monoxide From Industrial, Institutional, and Commercial Boilers, Steam Generators and Process Heaters, Amended on May 4, 2011).
2. Monterey Bay Air Resources District BARCT Schedule Report, Adopted On October 15, 2018.
3. Monterey Bay Air Resources District 2012 – 2015 Air Quality Management Plan, Published On March 15, 2017.
4. Santa Barbara Air Pollution Control District – Rule 361 (Boiler, Steam Generators, and Process Heaters – 2 to 5 MMBTU/hr), Amended on June 20, 2019.

5. Santa Barbara Air Pollution Control District – Rule 342 (Boiler, Steam Generators, and Process Heaters – 5 MMBTU/hr and greater), Amended June 20, 2019.
6. Santa Barba Air Pollution Control District – Staff Report Rule 361 and Rule 342, Published on May 13, 2019.
7. San Joaquin Valley Unified Air Pollution Control District – Rule 4307 (Boilers, Steam Generators, and Process Heaters – 2.0 MMBTU.hr to 5.0 MMBTU/hr), Amended October 16, 2008.
8. San Joaquin Valley Unified Air Pollution Control District – Rule 4320 (Boilers, Steam Generators, and Process Heaters – 2.0 MMBTU.hr to 5.0 MMBTU/hr), Amended October 16, 2008.
9. San Joaquin Valley Unified Air Pollution Control District, Appendix C, Cost Effectiveness Analysis For Proposed Amendments To Rule 4306 and Rule 4307 and Proposed New Rule 4320, Published on August 21, 2008.
10. San Luis Obispo County Air Pollution Control District – Rule 430 (Control of Oxides of Nitrogen From Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters), Amended on November 12, 2014.
11. Yolo-Solano Air Quality Management District – Staff Report for Rule 2.27, Large Boilers, Published on May 7, 2019.
Yolo-Solano Air Quality Management District – Staff Report for Rule 2.45, Boilers, Published on May 7, 2019.

7. Attachments

7.1 Attachment A: Public Comments

7.2 Attachment B: Response to Public Comments

7.3 Attachment C: Rule 441

ATTACHMENT A



Lance Ericksen
Environmental Engineer
Air Specialist

San Joaquin Valley SBU
Chevron North America
Exploration and Production
P. O. Box 1392
Bakersfield, CA 93302
Tel 661 654 7968
Fax 661 599-7295

December 11, 2019

Sent by Email

Amy Clymo
Compliance and Engineering Manager
Monterey Bay Air Resources District
24580 Silver Cloud Ct.
Monterey, CA 93940

RE: Comments on Draft Rule 441

Dear Ms. Clymo:

Thank you for meeting with me on proposed Rule 441 on December 5, 2019. As we discussed there are several items that we believe should be addressed before the Rule goes to the Board for adoption.

1. An allowance to defer source testing for up to five years provided quarterly monitoring of NOx and CO is conducted during the period. We believe this is a win/win with more frequent review of emissions using a less costly method. A more detailed proposal is attached.
2. An exemption for replacement standby units that only operate when another unit or units are not in operation. A more detailed proposal is attached.
3. A period longer than one year to retrofit units that lose exemption. To include capital projects in the budget and procurement process can take more than a year. This process should take no more than 18 months.
4. Express exemptions in both therms and MMBtu. This does not change the rule but improves readability.

Please telephone Lance Ericksen at (661) 654-7968 or (661) 599-7295, if there are questions.

Sincerely,

A handwritten signature in blue ink, appearing to read "Lance Ericksen".

Lance Ericksen
Health, Environment and Safety Specialist

Attachments

1. Deferred source testing
2. Replacement stand-by units

Deferral of Source Testing

San Joaquin Valley APCD rules including 4320 address deferrals of testing.

Deferral text:

Units that demonstrate compliance on two consecutive 12-month source tests may defer the following 12-month source test for up to 60 months (no more than 30 days before or after the required 60-month source test date). During the 60-month source testing interval, the operator shall monitor, in any calendar quarter the unit operates, NO_x and CO exhaust emission concentrations, and exhaust oxygen concentration.

Note: the five-year period is consistent with Chevron's TV permit (TV-67-01A) condition 31 for produced gas units.

Replacement Standby Unit

San Joaquin Valley APCD Rule 4305 provides exemption for Replacement Standby Units.

Definition

Replacement Standby Unit: a unit permanently installed at a single stationary source that replaces a primary unit during breakdown or maintenance of the primary unit. Simultaneous operation of the replacement standby unit and the primary unit shall not occur except during start-up, shutdown, or tune-up of the primary unit.

Exemption

Each unit that is operated as a Replacement Standby Unit that is operated with an annual heat input less than 90 billion Btu per year as made enforceable by Permit to Operate. The operator shall comply with one of the following:

tune the unit at least once each calendar year in which it operates by a qualified technician in accordance with manufacturer's recommendations or the procedure described in EPA 40 CFR 63, Subpart JJJJJ guidance, or

operate the unit in a manner that maintains exhaust oxygen concentrations at less than or equal to 3.00 percent by volume on a dry basis.



Lance Ericksen
Environmental Engineer
Air Specialist

San Joaquin Valley SBU
Chevron North America
Exploration and Production
P. O. Box 1392
Bakersfield, CA 93302
Tel 661 654 7968
Fax 661 599-7295

January 16, 2020

Sent by Email

Amy Clymo
Compliance and Engineering Manager
Monterey Bay Air Resources District
24580 Silver Cloud Ct.
Monterey, CA 93940

RE: Comments on Draft Rule 441 Presented January 15, 2020

Dear Ms. Clymo:

Thank you for addressing many of the comments made in Chevron's December 11, 2019 letter. Based on the discussions at the January 15, 2020 workshop Chevron offers the following additional comments for your consideration.

1. Provide an allowance for less frequent stack source testing based on a District approved plan with a combination of stack source testing and portable combustion analyzer monitoring. To support this proposal, I have attached stack testing and monitoring of steam generators in the San Joaquin Valley. In general, the monitoring tracks the source tests and tends to slightly over predict emissions.
2. Include a provision to allow a plan or other mechanism to return to low use status for units that may have an annual exceedance due to unusual circumstances. The rule as currently drafted requires automatic compliance that would apply to even small exceedances. Retrofits could be costly with little air quality benefit.
3. Extend the 30 ppm compliance range for smaller process heaters (heater treaters) from 5 to 8 MMBtu/hr. We are aware of technology that has been applied to heater treaters that can meet the 30 ppm level. We are not aware of any technology that has been used in practice with heater treaters to meet 15 ppm. If such retrofit technology has been used in heater treaters specific achieved in practice examples should be cited.

Please telephone Lance Ericksen at (661) 654-7968 or (661) 599-7295, if there are questions.

Sincerely,

A handwritten signature in blue ink, appearing to read "Lance Ericksen".

Lance Ericksen
Health, Environment and Safety Specialist

Attachments

AEROS ENVIRONMENTAL, INC.

Summary Of Results

Chevron U.S.A., Inc.
 Kern River
 Steam Generator RAS 144

Project 104-1619
 October 16, 2018
 Permit No. S-1131-884-21

Pollutant	ppm	ppm @ 3% O ₂	lb/hr	lb/MMBtu	Permit Limits
NO _x	9.95	10.19	0.54	0.0123	
	9.86	10.16	0.53	0.0122	
	9.96	10.23	0.53	0.0123	
Mean	9.92	10.19	0.53	0.0123	15 ppm @ 3% O ₂
CO	0.00	0.00	0.00	0.0000	
	0.00	0.00	0.00	0.0000	
	0.00	0.00	0.00	0.0000	
Mean	0.00	0.00	0.00	0.0000	50 ppm @ 3% O ₂
	ppm	gr/100 scf	lb/hr	lb/MMBtu	
Fuel Sulfur	As H ₂ S in Fuel Gas	As S in Fuel Gas	As SO ₂ in Stack Exhaust	As SO ₂ in Stack Exhaust	5 gr/100 scf
	<0.05	<0.003	<0.0003	<0.00001	
Comments: _____					

	A	B	C	D	E	F	G	H	I	J	K	L
	Unit ID	APCD Permit Num	Land E	Date	Time	O2	CO	NO2	NO	NOx	O2 Corr.	NOx Correc A
1	KR-SP-RAS-SG144	S-1131-884	233	1/4/2018	09:33:02	3.220	31.000	0.000	14.765	14.765	3%	14.9
03	KR-SP-RAS-SG144	S-1131-884	233	4/24/2018	13:07:54	3.380	3.000	0.853	10.175	11.028	3%	11.3
17	KR-SP-RAS-SG144	S-1131-884	233	6/25/2018	13:01:05	3.250	2.000	1.052	11.481	12.533	3%	12.7
86	KR-SP-RAS-SG144	S-1131-884	233	7/3/2018	06:10:59	3.240	12.000	0.258	11.550	11.808	3%	12.0
89	KR-SP-RAS-SG144	S-1131-884	233	8/13/2018	09:15:19	3.120	0.000	1.203	10.163	11.366	3%	11.4
138	KR-SP-RAS-SG144	S-1131-884	233	10/10/2018	09:26:29	3.300	1.000	0.300	9.857	10.157	3%	10.3
461	KR-SP-RAS-SG144	S-1131-884	233	11/5/2018	11:36:55	3.240	1.000	0.148	11.823	11.971	3%	12.1
30	KR-SP-RAS-SG144	S-1131-884	233	12/10/2018	07:20:53	5.250	0.000	0.115	9.687	9.802	3%	11.2

Aeros Environmental, Inc. Summary of Results

Chevron U.S.A., Inc.
Kern River
Steam Generator RAS-70

Project 104-1589
September 24, 2018
Permit No. S-1131-879-25

Pollutant	ppm	ppm @ 3% O ₂	lb/hr	lb/MMBtu	Permit Limits
NO _x	9.17	9.18	0.53	0.0111	15 ppm @ 3% O ₂
	9.02	9.09	0.52	0.0109	
	8.89	8.88	0.53	0.0107	
Mean	9.03	9.05	0.53	0.0109	
CO	0.00	0.00	0.00	0.0000	50 ppm @ 3% O ₂
	0.00	0.00	0.00	0.0000	
	0.00	0.00	0.00	0.0000	
Mean	0.00	0.00	0.00	0.0000	

	ppm	gr/100 scf	lb/hr	lb/MMBtu	
Fuel Sulfur	As H ₂ S in Fuel Gas	As S in Fuel Gas	As SO ₂ in Stack Exhaust	As SO ₂ in Stack Exhaust	5 gr/100 scf
	<0.05	<0.003	<0.0004	<0.00001	

Unit ID	APCD Permit Num	Land II Date	Time	O2	CO	NO2	NO	NOx	O2 Corr.	NOx Correc. Avg.
11 KR-SP-RAS-SG70	S-1131-879	229	3/17/2018 10:37:34	3.550	4.000	0.243	9.018	9.261	3%	9.6
11 KR-SP-RAS-SG70	S-1131-879	229	9/11/2018 04:42:15	3.180	2.000	0.235	10.996	11.231	3%	11.3
72 KR-SP-RAS-SG70	S-1131-879	229	10/1/2018 08:10:48	3.710	2.000	0.000	8.562	8.562	3%	8.9

Aeros Environmental, Inc. Summary of Results

Chevron U.S.A., Inc.
Kern River
Steam Generator RAS-71

Project 104-1589
September 24, 2018
Permit No. S-1131908-22

Pollutant	ppm	ppm @ 3% O ₂	lb/hr	lb/MMBtu	Permit Limits
NO _x	9.29	9.23	0.45	0.0111	15 ppm @ 3% O ₂
	8.94	8.88	0.43	0.0107	
	8.60	8.57	0.42	0.0103	
Mean	8.95	8.89	0.43	0.0107	
CO	0.00	0.00	0.00	0.0000	50 ppm @ 3% O ₂
	0.00	0.00	0.00	0.0000	
	0.00	0.00	0.00	0.0000	
Mean	0.00	0.00	0.00	0.0000	

	ppm	gr/100 scf	lb/hr	lb/MMBtu	
Fuel Sulfur	As H ₂ S in Fuel Gas	As S in Fuel Gas	As SO ₂ in Stack Exhaust	As SO ₂ in Stack Exhaust	5 gr/100 scf
	<0.05	<0.003	<0.0003	<0.00001	

Unit ID	APCD Permit Num	Land ID	Date	Time	O2	CO	NO2	NO	NOx	O2 Corr.	NOx Correc Avg.
KR-SP-RAS-SG71	S-1131-908	234	5/18/2018	05:50:39	3.430	9.000	0.244	6.136	6.380	3%	6.5
KR-SP-RAS-SG71	S-1131-908	234	6/4/2018	09:25:35	2.860	12.000	0.000	10.496	10.496	3%	10.4
KR-SP-RAS-SG71	S-1131-908	234	7/18/2018	11:29:32	3.480	0.000	1.331	11.853	13.184	3%	13.5
KR-SP-RAS-SG71	S-1131-908	234	8/13/2018	09:33:59	2.970	0.000	1.202	10.958	12.160	3%	12.1
KR-SP-RAS-SG71	S-1131-908	234	9/11/2018	04:50:05	3.080	2.000	0.126	11.893	12.019	3%	12.1
KR-SP-RAS-SG71	S-1131-908	234	10/1/2018	08:30:50	4.900	2.000	0.352	7.324	7.676	3%	8.6

AEROS ENVIRONMENTAL, INC.

Summary Of Results

**Chevron U.S.A., Inc.
Kern River
Steam Generator RAS 4**

**Project 104-1619
October 16, 2018
Permit No. S-1131-912-10**

Pollutant	ppm	ppm @ 3% O ₂	lb/hr	lb/MMBtu	Permit Limits
NO _x	11.96	11.84	0.67	0.0142	
	12.00	11.81	0.67	0.0142	
	11.30	11.11	0.63	0.0134	
Mean	11.76	11.58	0.65	0.0139	15 ppm @ 3% O₂
CO	0.00	0.00	0.00	0.0000	
	0.00	0.00	0.00	0.0000	
	0.00	0.00	0.00	0.0000	
Mean	0.00	0.00	0.00	0.0000	50 ppm @ 3% O₂
	ppm	gr/100 scf	lb/hr	lb/MMBtu	
Fuel Sulfur	As H ₂ S in Fuel Gas	As S in Fuel Gas	As SO ₂ in Stack Exhaust	As SO ₂ in Stack Exhaust	1.0 gr/100 scf
	<0.05	<0.003	<0.0004	<0.00001	
Comments: _____					

Unit ID	APCD Permit Num	Land #	Date	Time	O2	CO	NO2	NO	NOx	O2 Corr.	NOx Correc. Av
KR-SP-RAS-SG4	S-1131-912	235	1/15/2018	14:20:20	3.640	2.000	0.000	9.470	9.470	3%	9.8
KR-SP-RAS-SG4	S-1131-912	235	8/29/2018	10:06:44	3.440	0.000	0.706	9.345	10.051	3%	10.3
KR-SP-RAS-SG4	S-1131-912	235	9/4/2018	09:12:05	3.280	1.000	0.824	10.559	11.383	3%	11.6
KR-SP-RAS-SG4	S-1131-912	235	10/10/2018	09:47:08	2.990	0.000	0.000	11.158	11.158	3%	11.2
KR-SP-RAS-SG4	S-1131-912	235	11/5/2018	11:01:51	2.950	2.000	0.000	14.464	14.464	3%	14.4
KR-SP-RAS-SG4	S-1131-912	235	12/10/2018	07:09:25	3.820	0.000	0.000	11.573	11.573	3%	12.1

AEROS ENVIRONMENTAL, INC.

Summary Of Results

Chevron U.S.A., Inc.
 Kern River
 Steam Generator 51-5

Project 104-1527
 July 31, 2018
 Permit No. S-1131-1148-1

Pollutant	ppm	ppm @ 3% O ₂	lb/hr	lb/MMBtu	Permit Limits
NO _x	10.76	10.95	0.48	0.0132	
	10.69	10.90	0.48	0.0131	
	10.39	10.64	0.46	0.0128	
Mean	10.61	10.83	0.47	0.0130	15 ppm @ 3% O ₂
CO	0.00	0.00	0.00	0.0000	
	0.00	0.00	0.00	0.0000	
	0.00	0.00	0.00	0.0000	
Mean	0.00	0.00	0.00	0.0000	29 ppm @ 3% O ₂
	ppm	gr/100 scf	lb/hr	lb/MMBtu	
Fuel Sulfur	As H ₂ S in Fuel Gas <1	As S in Fuel Gas <0.06	As SO ₂ in Stack Exhaust <0.006	As SO ₂ in Stack Exhaust <0.0002	5 gr/100 scf
Comments: _____					

AEROS ENVIRONMENTAL, INC.

Summary Of Results

Chevron U.S.A., Inc.
Kern River
Steam Generator 46

Project 104-1527
July 31, 2018
Permit No. S-1131-877-24

Pollutant	ppm	ppm @ 3% O ₂	lb/hr	lb/MMBtu	Permit Limits
NO _x	11.50	11.36	0.75	0.0137	
	11.68	11.51	0.77	0.0138	
	11.52	11.38	0.75	0.0137	
Mean	11.57	11.42	0.76	0.0137	15 ppm @ 3% O₂
CO	0.00	0.00	0.00	0.0000	
	0.00	0.00	0.00	0.0000	
	0.00	0.00	0.00	0.0000	
Mean	0.00	0.00	0.00	0.0000	28 ppm @ 3 % O₂
	ppm	gr/100 scf	lb/hr	lb/MMBtu	
Fuel Sulfur	As H ₂ S in Fuel Gas	As S in Fuel Gas	As SO ₂ in Stack Exhaust	As SO ₂ in Stack Exhaust	5 gr/100 scf
	<1	<0.06	<0.009	<0.0002	
Comments: _____					

	A	B	C	D	E	F	G	H	I	J	K	L	M
	Unit ID	APCD Permit Num	Non Land II	Date	Time	O2	CO	NO2	NO	NOx	O2 Corr	NOx Correc	Avg.
1	KR-SP-MC1-SG46	S-1131-877	228	1/22/2018	15:50:25	3.420	0.000	0.122	11.081	11.203	3%	11.5	
1	KR-SP-MC1-SG46	S-1131-877	228	2/7/2018	14:01:12	3.650	0.000	0.000	12.774	12.774	3%	13.3	
1	KR-SP-MC1-SG46	S-1131-877	228	3/29/2018	13:45:36	3.180	3.000	0.000	11.921	11.921	3%	12.0	
1	KR-SP-MC1-SG46	S-1131-877	228	4/4/2018	15:56:52	3.850	1.000	0.000	12.725	12.725	3%	13.4	
1	KR-SP-MC1-SG46	S-1131-877	228	5/15/2018	06:58:46	3.210	1.000	0.244	11.885	12.129	3%	12.3	
2	KR-SP-MC1-SG46	S-1131-877	228	6/18/2018	12:39:39	3.060	0.000	1.354	11.913	13.267	3%	13.3	
1	KR-SP-MC1-SG46	S-1131-877	228	7/2/2018	15:30:24	2.980	0.000	1.653	11.900	13.553	3%	13.5	
1	KR-SP-MC1-SG46	S-1131-877	228	8/13/2018	14:00:09	3.150	3.000	1.647	12.959	14.606	3%	14.7	
7	KR-SP-MC1-SG46	S-1131-877	228	9/4/2018	14:15:27	2.940	0.000	1.176	11.763	12.939	3%	12.9	
1	KR-SP-MC1-SG46	S-1131-877	228	10/23/2018	12:11:48	3.070	0.000	0.449	15.310	15.759	3%	15.8	
2	KR-SP-MC1-SG46	S-1131-877	228	11/27/2018	11:47:21	3.580	0.000	0.298	11.954	12.252	3%	12.7	
1	KR-SP-MC1-SG46	S-1131-877	228	12/10/2018	08:20:55	3.850	0.000	0.000	13.225	13.225	3%	13.9	

AEROS ENVIRONMENTAL, INC.

Summary Of Results

Chevron U.S.A., Inc.
 Kern River Field
 Steam Generator 140

Project 104-1471
 May 30, 2018
 Permit No. S-1131-880-18

Pollutant	ppm	ppm @ 3% O ₂	lb/hr	lb/MMBtu	Permit Limits
NO _x	8.48	8.80	0.43	0.0106	
	8.78	9.06	0.46	0.0109	
	8.81	9.09	0.46	0.0109	
Mean	8.69	8.99	0.45	0.0108	15 ppm @ 3% O₂
CO	0.00	0.00	0.00	0.0000	
	0.00	0.00	0.00	0.0000	
	0.00	0.00	0.00	0.0000	
Mean	0.00	0.00	0.00	0.0000	41 ppm @ 3% O₂
	ppm	gr/100 scf	lb/hr	lb/MMBtu	
Fuel Sulfur	As H ₂ S in Fuel Gas	As S in Fuel Gas	As SO ₂ in Stack Exhaust	As SO ₂ in Stack Exhaust	5 gr/100 scf
	1.74	0.10	0.012	0.00028	
Comments: _____					

Unit ID	APCD Permit Num	Land II Date	Time	O2	CO	NO2	NO	NOx	O2 Corr.	NOx Correc Avg.	
KR-SP-RAS-SG140	S-1131-880	230	1/15/2018	11:02:00	5.030	3.000	0.243	6.549	6.792	3%	7.7
KR-SP-RAS-SG140	S-1131-880	230	5/14/2018	15:01:10	4.430	1.000	0.000	7.005	7.005	3%	7.6
KR-SP-RAS-SG140	S-1131-880	230	6/4/2018	09:04:29	3.960	11.000	0.000	9.927	9.927	3%	10.5
KR-SP-RAS-SG140	S-1131-880	230	7/3/2018	06:08:04	6.390	2.000	0.752	7.655	8.407	3%	10.4
KR-SP-RAS-SG140	S-1131-880	230	8/29/2018	13:11:09	4.380	0.000	0.470	7.314	7.784	3%	8.4
KR-SP-RAS-SG140	S-1131-880	230	9/4/2018	08:56:05	4.200	1.000	1.060	10.143	11.203	3%	12.0
KR-SP-RAS-SG140	S-1131-880	230	10/9/2018	12:26:07	5.270	0.000	0.450	6.844	7.294	3%	8.4
KR-SP-RAS-SG140	S-1131-880	230	11/28/2018	15:38:28	5.410	2.000	0.149	11.137	11.286	3%	13.0
KR-SP-RAS-SG140	S-1131-880	230	12/10/2018	07:25:37	5.290	1.000	0.000	9.500	9.500	3%	10.9

Aeros Environmental, Inc.
Summary of Results

Chevron U.S.A., Inc.
 Kern River Field
 Steam Generator 81-4

Project 104-1431
 April 2, 2018
 Permit No. S-1131-1155-0

Pollutant	ppm	ppm @ 3% O ₂	lb/hr	lb/MMBtu	Permit Limits
NO _x	10.10	10.43	0.76	0.0126	15 ppm @ 3% O ₂
	10.01	10.38	0.75	0.0125	
	10.25	10.57	0.76	0.0127	
Mean	10.12	10.46	0.76	0.0126	
CO	0.00	0.00	0.00	0.0000	29 ppm @ 3% O ₂
	0.00	0.00	0.00	0.0000	
	0.00	0.00	0.00	0.0000	
Mean	0.00	0.00	0.00	0.0000	

	ppm	gr/100 scf	lb/hr	lb/MMBtu	
Fuel Sulfur	As H ₂ S in Fuel Gas	As S in Fuel Gas	As SO ₂ in Stack Exhaust	As SO ₂ in Stack Exhaust	5 gr/100 scf and 0.11 lb/MMBtu
	1.3	0.08	0.013	0.0002	

Unit ID	APCD Permit Num	Land Use	Date	Time	O2	CO	NO2	NO	NOx	O2 Corr.	NOx Correc Avg.	
56	KR-SP-M1-SG81	S-1131-1155	75	1/4/2018	10:19:08	3.530	0.000	0.121	11.484	11.605	3%	12.0
101	KR-SP-M1-SG81	S-1131-1155	75	2/7/2018	14:17:56	3.450	0.000	0.000	12.764	12.764	3%	13.1
112	KR-SP-M1-SG81	S-1131-1155	75	3/7/2018	10:30:15	3.790	1.000	0.000	8.649	8.649	3%	9.0
117	KR-SP-M1-SG81	S-1131-1155	75	4/4/2018	16:12:36	4.820	2.000	0.365	11.457	11.822	3%	13.2
130	KR-SP-M1-SG81	S-1131-1155	75	5/18/2018	06:15:14	4.020	1.000	0.244	12.705	12.949	3%	13.7
131	KR-SP-M1-SG81	S-1131-1155	75	6/8/2018	06:45:28	3.910	0.000	0.150	11.068	11.218	3%	11.8
139	KR-SP-M1-SG81	S-1131-1155	75	7/2/2018	15:32:56	4.000	1.000	1.290	12.293	13.583	3%	14.4
170	KR-SP-M1-SG81	S-1131-1155	75	8/13/2018	13:44:01	4.020	3.000	1.647	11.738	13.385	3%	14.2
232	KR-SP-M1-SG81	S-1131-1155	75	9/4/2018	14:32:08	3.840	0.000	1.293	11.350	12.643	3%	13.3
362	KR-SP-M1-SG81	S-1131-1155	75	10/1/2018	12:37:11	3.730	1.000	0.704	8.122	8.826	3%	9.2
531	KR-SP-M1-SG81	S-1131-1155	75	11/5/2018	13:28:54	4.710	0.000	1.498	11.300	12.798	3%	14.1
762	KR-SP-M1-SG81	S-1131-1155	75	12/19/2018	12:49:58	3.710	1.000	0.229	12.300	12.529	3%	13.0



January 16, 2020

Seong Kim
Monterey Bay Air Resources District
24580 Silver Cloud Court
Monterey, CA 93940

RE: Comments on Draft Rule 441

Dear Mr. Kim:

Aera Energy LLC (Aera) is an independent oil and gas producer with operations in Monterey County. The Monterey Bay Air Resources District (MBARD) has circulated draft Rule 441 *Boilers, Steam Generators, and Process Heaters* for public review. Aera operates external combustion equipment that will be subject to Rule 441 and is providing the following suggestions to improve the Rule.

Section 3.3.2: Aera's heater treaters are already equipped with fuel meters that are relied on for various regulatory reporting purposes including: 1) annual criteria emission reporting to the MBARD; 2) annual greenhouse gas emission reporting to the California Air Resources Board; and 3) air toxics reporting under AB2588. These orifice meters measure fuel volumes that are recorded electronically within Aera's data collection systems. These daily volumes are summed to report annual volumes.

As currently drafted, Rule 441 requires a "dedicated non-resetting totalizing fuel meter" for each unit. On a first read, this requirement appears to be a reasonable standard. However, a non-resetting meter will continue to totalize beyond a calendar year. Therefore, an operator (or MBARD inspector) will have to know what the meter read at midnight on January 1st to know the fuel consumed under the current year.

Aera requests that the word "non-resetting" be removed from Section 3.3.2. The enforceability of the Rule will not be lessened, as Section 5.1.2 requires at least monthly fuel records that can be summed to compare to the annual heat input limit.

Section 4.2.2: This section is unclear as to how it applies to heater treaters with two separate burners and exhaust stacks. Aera assumes that the annual heat input limit of

90,000 therms per unit in Section 1.3.7 applies to the heater treater and not each burner. As such, the term “unit” as used in Section 1.3.7 is intended to encompass the heater treater (including both burners).

In explaining how to apply the portable analyzer test results, the phrases of “NOx emissions from the unit” and “the unit will be required to be source tested” are utilized in Section 4.2.2. If a heater treater equipped with two separate burners constitute a single “unit”, it is not clear how MBARD staff intend any portable analyzer testing results to be evaluated for compliance under Section 4.2.2. Would the operator need to average the portable analyzer test results from each stack to obtain the average NOx concentration for the “unit”? Aera suggests memorializing how MBARD staff foresees Section 4.2.2 being applied to heater treaters with two burners in the staff report.

Section 4.3: As currently drafted, any unit that exceeds a low use exemption is required to be retrofitted with a low NOx burner(s). This establishes an inflexible standard that may cause unintended consequences. For example, a boiler may be operated well below its low use exemption for several years without issue. An unexpected event occurs that requires the unit to be utilized more than historical operations, but then returns to normal operations. Under the drafted rule, if that abnormal operating period causes the unit to exceed its low use exemption, that unit will have to be retrofitted regardless if the abnormal conditions subsided.

To address such situations, Aera suggests that a second option be added to Section 4.3 allowing an operator to submit a plan to lower the fuel use for that unit and return to conformance with its low use exemption. The South Coast Air Quality Management District (SCAQMD) recently formalized a similar strategy when adopting its Rule 1118.1 *Control of Emissions From Non-Refinery Flares*. Rule 1118.1 (d)(3)(B) provides the option of notifying the SCAQMD and implementing a process to reduce flare use. Aera suggests that a similar process be allowed in Section 4.3 of Rule 441.

Section 4.3.3: The proposed 12-month timeline to retrofit a unit with low NOx equipment is not realistic. Fulfilling the MBARD regulatory requirements, such as obtaining an Authority to Construct and reviewing source testing documents, will consume several months. Aera believes that the timeline should be extended to 24 months.

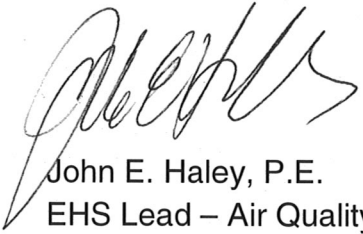
Section 4.5.1: Requiring a source test at the “as-found operating conditions” while simultaneously “at the maximum attainable firing rate allowed by the District permit” is an inherent contradiction. For example, if a unit normally operates at 60% of its maximum

Mr. Seong Kim
January 16, 2020
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firing rate, would the unit be source tested at the normal 60% firing rate or an artificial 100% firing rate? Further, many units may not be capable of firing at the maximum rate allowed by their permit. Aera suggests that the unit be source tested at "conditions representative of normal operation".

Aera appreciates the opportunity to provide input during the rulemaking process. Should you have any questions, please feel free to contact me at (661) 665-5279.

Sincerely,



John E. Haley, P.E.
EHS Lead – Air Quality

cc: Lowell Pollema, Aera Energy LLC
Mike Ohman, Aera Energy LLC

ATTACHMENT B

Chevron U.S.A. Inc. (CUSA) Comments

#	Description	Comment	MBARD's Response
Letter Dated December 11, 2019			
1	Annual source testing requirements	Allow to defer source testing for up to five years and provide quarterly monitoring of NOx and CO.	<p>Based on the proposed Rule 441 testing requirements and permitted equipment at Chevron's facility, this comment applies to steam generators. Chevron's permitted boilers and heaters fall within the size range where Rule 441 allows portable analyzer testing. Current MBARD permits require annual source testing of steam generators and in some cases quarterly testing. Current MBARD permits for the boilers or process heaters have no testing requirements because the permit conditions contain no emission limits.</p> <p>MBARD contacted EPA regarding the use of portable analyzers in lieu of source tests for steam generators, and received the following guidance:</p> <ol style="list-style-type: none"> a. If a facility is subject to federal oversight (Title V) and is subject to source testing, then that facility is required to meet EPA Test Method requirements. b. Test methods are considered "Technology Neutral", so if a portable analyzer can meet EPA Test Method requirements, then it is acceptable. <p>Three out of the four AB 617 Industrial Sources subject to Rule 441 are also Title V facilities and per MBARD's source testing policy, all testing requirements must meet be in accordance with EPA Test Methods. Currently, MBARD is not aware of any known portable analyzers on the market that can meet EPA Test Method requirements. Although there are two Conditional Test Methods (CTM-030 and CTM-034) for testing of NO_x/CO/O₂ with portable analyzers, these methods are not approved by EPA and would require formal approval before it can be used at sites subject</p>

#	Description	Comment	MBARD's Response
			to federal oversight. CTM-030 and CTM-034 have been around since the 1990s, but they still require further support from field, lab, and direct comparison from studies to be approved. Thus, after further review, MBARD will continue to require annual source testing for oilfield steam generators greater than or equal to 2 MMBTU/hr and boilers or process heaters greater than or equal to 20 MMBTU/hr as required in Rule 441.
2	Exemption	An exemption for replacement standby units that only operate when another unit are not in operation.	MBARD added an additional exemption in Section 1.3.7.2 allowing any unit that uses less than 10% of its maximum heat input capacity in any calendar year and does not exceed a NO _x exhaust concentration of 30 ppmv and a CO concentration of 400 ppmv at 3% O ₂ to be exempt from the Rule 441 emission limits.
3	Loss of exemption	A period longer than one year to retrofit unit(s) that lose exemption.	MBARD revised Section 4.3.3 to increase the compliance timeline from 12 months to 18 months.
4	Low-fuel usage exemption	Express exemption in both therms and MMBTU.	MBARD revised Section 1.3.7.1 to express the low-fuel usage exemption in 90,000 therms or 9 billion BTU per year of fuel provided.
Letter Dated January 16, 2020			
1	Annual source testing requirement	Allowance for less frequent source testing based on a District approved plan with a combination of source testing and portable analyzer monitoring.	Please see MBARD's response above to Chevron's letter dated on December 11, 2019.
2	Loss of exemption	Include a provision to allow a plan or other mechanism to return to low-use status for units that may have an annual exceedance due to unusual	The intent of the exemption threshold is to identify when a unit is not subject to the Rule 441 emission limits. The fuel exemption threshold will be included as a permit condition and it would be a permit violation to exceed the fuel throughput. Therefore, after further review, MBARD will not revise the low-fuel usage exemption to allow a provision to

#	Description	Comment	MBARD's Response
		circumstances. The rule as currently drafted requires automatic compliance.	return to low-use status. One of the main goals of this Rule is to retrofit existing units. MBARD reviewed Chevron's past three years of operation for the heater treaters and found the units operated between 6.7 to 8.42 billion BTU per year of fuel which is below the low-use exemption threshold. Thus, Chevron should continue to maintain records of fuel use and plan accordingly to operate the units in a way to meet the low-fuel usage exemption. Furthermore, MBARD would like to clarify that the unit has within 18 months to demonstrate compliance with the Section 3.1 of Rule 441 rather than an "automatic compliance" once the unit exceeds the low-use fuel threshold.
3	BARCT emission requirements	Extend the 30 ppm compliance range for heater treaters from 5 to 8 MMBTU/Hr.	MBARD reached out to the vendors and was informed that the cost to retrofit the units to achieve the 15 ppm or the 30 ppm limit is the same. Thus, MBARD will keep the proposed limits as it is more cost-effective to achieve a lower emission limit of 15 ppm for the same cost.

Aera Energy LLC. Comments

#	Description	Comment	MBARD's Response
Letter Dated January 16, 2020			
1	Fuel meters	Request to remove the word "non-resetting" be removed from Section 3.3.2.	After further review, MBARD will remove the word "non-resetting" from the phrase "dedicated non-resetting totalizing fuel meter" in Section 3.3.2.
2	Portable analyzer monitoring	Clarification on how MBARD staff intend any portable analyzer testing results to be evaluated for compliance under Section 4.2.2	Per Aera's comment, MBARD will prepare a Frequently Asked Questions (FAQs) document upon Board approval of the rule. In the FAQs, MBARD will provide information on how MBARD would enforce the portable analyzer monitoring requirements for heater treaters.

#	Description	Comment	MBARD's Response
3	Low-fuel usage exemption	To include a second option be added to Section 4.3 allowing an operator to submit a plan to lower the fuel use for that unit and return to conformance with its low use exemption. Aera suggest to use a similar provision listed in SCAQMD Rule 1118.1(d)(3)(B).	<p>See also above the response to Chevron's comment #2 to the letter dated January 16, 2020.</p> <p>Upon review of SCAQMD Rule 1118.1 (d)(3)(B), MBARD understands the concerns made by Aera regarding a unit exceeding a low use exemption. However, upon review of fuel usage data for both Chevron and Aera, MBARD has decided not to revise Section 4.3 to allow a provision that would allow the low-use unit to regain its status after it exceeds the thresholds. MBARD reviewed Aera's past three years of operation of its heater treaters and found the units were operating well below the 9 billion BTU per year exemption threshold. Specifically, the units operated between 0 to 4.6 billion BTU per year of fuel. Thus, similar to Chevron, MBARD believes that with consistent recordkeeping and careful planning Aera has the ability to operate below the low-fuel usage threshold even taking into account unexpected events.</p>
4	Loss of exemption	The proposed 12-month timeline to retrofit a unit with low NOx equipment is not realistic. Aera suggests to increase the timeline to be 24 months.	MBARD revised Section 4.3.3 to increase the compliance time from 12 months to 18 months.
5	Source-testing	Aera suggests that the unit be source tested at "conditions representative of normal operation"	After further review of Aera's comment, MBARD agrees and has revised Section 4.5.1 to state, "All emission determinations shall be made during conditions representative of normal operation."

ATTACHMENT C

**MONTEREY BAY AIR RESOURCES DISTRICT
REGULATION IV
PROHIBITIONS**

RULE 441. BOILERS, STEAM GENERATORS, AND PROCESS HEATERS

(Proposed ~~X2-XX19~~-20.)

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PART 1 GENERAL

1.1 Purpose

To reduce emissions of oxides of nitrogen (NO_x) from boilers, steam generators, and process heaters at subject industrial sources per Health and Safety Code §40920.6 (c)(2).

1.2 Applicability

This rule applies to AB 617 industrial sources that have boilers, steam generators, and process heaters with a rated heat input greater than or equal to 2 million British Thermal Units (BTU) per hour.

1.3 Exemptions

The requirements of this Rule shall not apply to the following:

- 1.3.1 Any unit that is exclusively used by an electric utility to generate electricity.
- 1.3.2 Waste heat recovery boilers.
- 1.3.3 Afterburners, vapor incinerators, or thermal or catalytic oxidizers used as an emission control device.
- 1.3.4 Kilns, ovens, open heated tanks, dehydrators, dryers, crematories, calciners, cookers, roasters, furnaces, or smelters.

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1.3.5 Solid fuel fired units.

The requirements of Section 3.1 of this Rule shall not apply to the following:

1.3.6 Any unit when under curtailment conditions, provided that the curtailment fuels are not burned for more than 200 cumulative hours in a calendar year, including testing and maintenance.

1.3.7 Low Fuel Usage Exemption

~~Any unit that uses less than 90,000 therms per year of fuel provided that the owner or operator complies with one of the requirements listed in Section 3.2, the requirements of Section 3.3.2, and the Compliance Schedule of Section 4.4.2. If the fuel usage for any unit claiming this exemption exceeds or equals 90,000 therms in any calendar year, then unit must be operated in compliance with the applicable NO_x emission limits in Section 3.1. within the timeline defined by Section 4.3.3~~

1.3.7.1 Any unit that uses less than 90,000 therms or 9 billion BTU per year of fuel provided that the owner or operator complies with one of the requirements listed in Section 3.2, the requirements of Section 3.3.2, and the Compliance Schedule of Section 4.4.2. If the fuel usage for any unit claiming this exemption exceeds or equals 90,000 therms or 9 billion BTU in any calendar year, then the unit must be operated in compliance with the applicable NO_x emission limits in Section 3.1. within the timeline defined by Section 4.3.3.

1.3.7.2 Any unit that uses less than 10% of its maximum heat input capacity in any calendar year and does not exceed a NO_x exhaust concentration of 30 ppmv and a Carbon Monoxide (CO) concentration of 400 ppmv at 3 percent oxygen. If the fuel usage or the concentration limits are exceeded, then the unit must be operated in compliance with the applicable NO_x emission limits in Section 3.1 within the timeline defined by Section 4.3.3.

1.3.8 Any non-operational unit, as defined in Section 2.11, provided that the owner or operator complies with the Compliance Schedule of Section 4.4.3.

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1.3.9 Any unit, that provides emission reduction credits per Rule 215 in lieu of meeting the emission standards in Section 3.1, provided that the owner or operator complies with the Compliance Schedule of Section 4.4.

1.4 Effective Date

This Rule, ~~as most recently revised,~~ is effective on ~~Month-February XX19,~~ 2020.

PART 2 DEFINITIONS

For the purpose of this Rule, the definitions below shall apply.

2.1 AB 617 Industrial Source

Means any source located at a facility that, as of January 1, 2017, was subject to a market-based compliance mechanism adopted by the state board pursuant to Health and Safety Code §38562(c).

2.2 Annual Heat Input

Means the total heat input of fuels burned by a unit in a calendar year, as determined from the higher heating value and cumulative annual usage of each fuel.

2.3 Best Available Retrofit Control Technology (BARCT)

Best available retrofit control technology as defined in Health and Safety Code §40406 is “an emission limitation that is based on the maximum degree of reduction achievable, taking into account environmental, energy, and economic impacts by each class or category of sources.” These limits are specified in Table 1 of this Rule.

2.4 Boiler or Steam Generator

Any external combustion equipment fired with any fuel used to produce hot water or steam, excluding waste heat recovery boilers.

2.5 British Thermal Unit (BTU)

The amount of heat required to raise the temperature of one pound of water from 59°F to

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60°F at one atmosphere.

2.6 Curtailment Conditions

Periods in which a unit that normally burns Public Utilities Commission (PUC) quality natural gas instead burns a nongaseous fuel only during emergency interruption of natural gas delivery by the serving utility.

2.7 Dryer

Any unit where the material being dried comes into direct contact with the product of combustion.

2.8 Gaseous Fuel

Any fuel which is a gas at standard conditions.

2.9 Heat Input

The chemical heat released due to fuel combustion in a combustion unit, using the higher heating value of the fuel. This does not include the sensible heat of incoming combustion air.

2.10 Higher Heating Value (HHV)

The total heat liberated per mass of fuel burned (BTU per pound), when fuel and dry air at standard conditions undergo complete combustion and all resultant products are brought to their standard states at standard conditions. HHV shall be determined by one of the following test methods:

208.1 ASTM D 2015 for solids fuel; or

208.2 ASTM D 240 or ASTM D 2382 for liquid hydrocarbon fuels; or

208.3 ASTM D 1826 or ASTM D 1945 in conjunction with ASTM D 3588 for gaseous fuels.

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2.11 Non-Operational Unit

Any unit not in operation during calendar year 2019, provided that the unit is —physically located at the affected AB 617 Industrial Source.

2.12 NO_x Emissions (NO_x)

The sum of nitric oxide and nitrogen dioxide in the flue gas.

2.13 Nongaseous Fuel

Any fuel which is not a gas at standard conditions.

2.14 Oilfield Steam Generator

An external combustion equipment which converts water to dry steam or to a mixture of water vapor and steam, with an absolute pressure of more than 30 psia, and which is used exclusively in thermally enhanced crude oil production.

2.15 Parts Per Million By Volume (ppmv)

The ratio of the number of gas molecules of a given species, or group of species, to the number of millions of total gas molecules.

2.16 Process Heater

Any combustion equipment fired with any fuel, and which transfers heat from combustion gases to water or process streams. For the purpose of this rule applicability, process heater does not include any of the following combustion sources:

- a. Kilns, ovens, open heated tanks, dehydrators, dryers, crematories, incinerators, calciners, cookers, roasters, furnaces, or smelters.
- b. Afterburners, vapor incinerators, or thermal or catalytic oxidizers used as an emission control device.

2.17 Public Utilities Commission (PUC) Quality Natural Gas

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Any gaseous fuel or gas-containing fuel where the sulfur content is no more than one-fourth (0.25) grain of hydrogen sulfide per one hundred (100) standard cubic feet and no more than five (5) grain of total sulfur per one hundred (100) standard cubic feet. PUC quality natural gas also means high methane gas (at least 80% methane by volume) as specified in the most current PUC General Order for Gas Service in California.

2.18 Rated Heat Input Capacity

The heat input capacity, in million BTU per hour, specified on the nameplate of the combustion unit. If the combustion unit has been altered or modified such that its combined maximum heat input is different than the heat input capacity specified on the nameplate, the combined maximum heat input shall be considered as the rated heat input.

2.19 Solid Fuel

Any fuel which is a solid at standard conditions.

2.20 Standard Conditions

For the purpose of this rule, standard conditions are 68°F and one atmosphere.

2.21 Therm

One hundred thousand (100,000) BTUs.

2.22 Unit

Any boiler, steam generator, or process heater as defined in Section ~~2.34~~, ~~2.13-14~~ and ~~2.1516~~.

2.23 Waste Heat Recovery Boiler

A device that recovers normally unused energy and converts it to usable heat. Waste heat recovery boilers incorporating duct or supplemental burners that are designed to supply 50 percent or more of the total rated heat input capacity of the waste heat recovery boiler are not considered waste heat recovery boilers, but are considered boilers. Waste heat recovery boilers are also referred to as heat recovery steam generators.

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PART 3 STANDARDS

All ppmv emission limits specified in Part 3 shall be measured as ppmv on a dry basis, as determined pursuant to Section 4.5.2, and corrected to three percent oxygen. Any unit subject to this Rule shall be subject to the following NO_x and CO requirements:

3.1 BARCT Emission Limits

NO_x and CO emissions shall not exceed the following levels:

Table 1. Emission Limits for AB 617 Industrial Units

Source Category	Total Unit Rated Heat Input/Description (MMBTU/hr)	Fuel	NO _x Limit (ppmv @ 3% O ₂)	CO Limit (ppmv @ 3% O ₂)
Boilers & Process Heaters	≥ 2 to < 5	Gaseous	30	400
	≥ 5 to < 20		15	400
	≥ 20		9	400
Oilfield Steam Generators	≥ 2	Gaseous	15	400

3.2 Low Fuel Usage

Any unit exempted pursuant to Section 1.3.7 shall meet one of the following conditions:

- 3.2.1 The unit shall be operated in a manner that maintains stack-gas oxygen concentration at less than or equal to 3.00% by volume on a dry basis; or
- 3.2.2 The unit shall be tuned at least once per year by a qualified technician. If the unit did not operate for the entire calendar year, the tune-up must be conducted within 30 days of startup. The tune-up shall be performed in accordance with manufacturer’s recommendations or EPA 40 CFR 63, Subpart JJJJJ guidance.

3.3 Monitoring Equipment

- 3.3.1 Owners or operators of units exempt from the emission requirements pursuant to Section 1.3.6 because of curtailment conditions shall install and maintain a non-

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totalizing hour meter on each unit, or shall install a computerized tracking system that maintains a continuous daily record of hours of operation.

3.3.2 Owners or operators of units exempt from the emission requirements pursuant to Section 1.3.7 because of low fuel usage shall install and maintain a dedicated ~~non-~~~~resetting~~ totalizing fuel meter in each fuel line. If a volumetric flow rate meter is installed, it must compensate for temperature and pressure using integral gauges.

3.4 Performance Testing

Any unit subject to Section 3.1 shall perform testing to demonstrate compliance with the emission limitation in accordance with the following frequency:

Table 2. Performance Testing

Section	Source Category	Total Unit Rated Heat Input/Description (MMBTU/hr)	Testing Method & Frequency
3.4.1	Boiler & Process Heaters	≥ 2 to < 5	Portable analyzer test at least once every calendar year
3.4.2		≥ 5 to < 20	
3.4.3	Boiler & Process Heaters	≥ 20	Source test at least once every calendar year
3.4.4	Oilfield Steam Generator	≥ 2	Source test at least once every calendar year

PART 4 ADMINISTRATIVE REQUIREMENTS

4.1 Reporting Tune-Up Verification

The owner or operator of units subject to the requirements in Section 3.2.2 of this Rule shall submit to the Air Pollution Control Officer a tune-up verification report or a verification of inactivity not less than once every calendar year for each unit.

4.2 Source Testing Protocol

4.2.1 **Source Tests:** The owner or operators of units subject to Section 3.4.3 and 3.4.4 in Table 2 of this Rule shall submit a written testing protocol to the District ~~for~~

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~~approval~~ no later than 30 days prior to the test event, and District notification at least 10 days prior to the actual date of testing shall be provided so that a District observer can be present. The owner or operator shall furnish the District written results of such performance tests within 60 days of the source test date.

- 4.2.2 **Portable Analyzer:** Emission readings ~~shall be taken~~ shall be taken from each exhaust stack using a portable analyzer pursuant to Section 3.4.1 through 3.4.2 in Table 2 of this Rule shall be averaged over a 15 consecutive-minute period by either taking a cumulative 15-consecutive-minute sample reading or by taking at least five (5) readings evenly spaced over the 15-consecutive-minute period. If the results of the portable analyzer show that the NO_x emissions from the unit exceed the allowable limits in Table 1 of this Rule, then the unit will be required to be source tested no later than 60 days from the date of discovering such exceedance.

4.3 Loss of Exemption

Any owner or operator of any existing unit that qualified for the Section 1.3.7 low fuel usage exemption ~~where the fuel usage exceeds 90,000 therms at any time within a calendar year and exceeded the low fuel usage limits of Section 1.3.7.1 or 1.3.7.2~~ shall comply with the following:-:

- 4.3.1 Within 30 days of the exceedance notify the District in writing of the unit's loss of exemption.
- 4.3.2 Within 90 days submit an Authority to Construct permit application to comply with Section 3.1 of this Rule.
- 4.3.3 Within ~~12~~ 18 months after the end of calendar year during which the unit exceeded the low fuel usage exemption level, conduct an initial performance test and demonstrate compliance with Section 3.1 of this Rule. The unit will subsequently not qualify for exemption pursuant to Section 1.3.7.

4.4 Compliance Schedule

- 4.4.1 An owner or operator of any unit subject to Table 1 of this Rule shall fulfill the following requirements:

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- 4.4.1.1 By December 31, 2020, submit a written plan containing a description of the method the owner or operator will use to comply with the emission limits listed in Table 1 of this Rule.
- 4.4.1.2 By December 31, 2021, submit an application for Authority to Construct for any modification required to achieve compliance with the requirements of Table 1 of this Rule, or submit an application to surrender emission reduction credits.
- 4.4.1.3 By December 31, 2023, all owners or operators subject to this Rule shall demonstrate final compliance with all applicable standards and requirements of this Rule.
- 4.4.2 Any owner or operator of any unit claiming the low usage exemption of Section 1.3.~~5~~7 shall fulfill the following requirements:
 - 4.4.2.1 By July 1, 2020, submit an application for Authority to Construct for any existing unit for which the low usage exemption pursuant to Section 1.3.~~5~~7 will be claimed.
 - 4.4.2.2 If the unit loses its exemption, the owner or operator must follow the requirements of Section 4.3.
- 4.4.3 An owner or operator of any unit claiming non-operational equipment shall fulfill the following requirements:
 - 4.4.3.1 By July 1, 2020, submit a Permit to Operate modification application for any existing unit for which the non-operational status will be claimed. The unit will be required to meet the requirements of Table 1 of this Rule prior to the unit becoming operational.
- 4.5 Compliance Determination
 - 4.5.1 All emission determinations shall be made ~~in the as-found~~during conditions representative of normal operating conditions~~operations, at the maximum attainable firing rate allowed by the District permit.~~ No determination of compliance with the requirement of Section 3.1 shall be established during startup, shutdown, or under breakdown conditions.

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4.5.2 All ppmv emission limits specified in Section 1.3.4-7.2 and 3.1 are referenced at dry stack-gas conditions and 3.00 percent by volume stack-gas oxygen. Emission concentrations shall be corrected to 3.00 percent oxygen as follows:

$$[ppm\ NO_x]_{corrected} = \frac{20.9\% - 3.0\%}{20.9\% - [\%O_2]_{measured}} * [ppm\ NO_x]_{measured}$$

PART 5 RECORDKEEPING REQUIREMENTS

5.1 The records required by Sections 5.1.1 through 5.1.3 shall be maintained for five (5) calendar years and shall be made available to District staff upon request.

5.1.1 The operator of any unit operated under the exemption of Section 1.3.6 shall monitor and record for each unit the cumulative annual hours of operation on each fuel other than PUC quality natural gas during periods of natural gas curtailment and equipment testing and maintenance.

5.1.2 The operator of any unit operated under the exemption of Section 1.3.7 shall record the amount of fuel used at least on a monthly basis for each unit.

5.1.3 The operator of any unit subject to Section 3.2.1 or 3.2.2 shall maintain records to verify that the required tune-up and the required monitoring of the operational characteristics of the unit have been performed.

PART 6 TEST METHODS

6.1 Compliance with NOx emission and oxygen requirements of Section 3.1 shall be determined using the following test methods:

6.1.1 Oxides of Nitrogen – ARB Method 100 or EPA Method 7E~~z~~

6.1.2 Stack Gas Oxygen – ARB Method 100 or EPA Method 3A

6.1.3 Carbon Monoxide – ARB Method 100 or EPA Method 10

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- 6.2 Test methods other than those specified in Section 6.1 for oxides of nitrogen and stack-gas oxygen, may be used to determine compliance so long as they are functionally equivalent and approved by the Air Pollution Control Officer and EPA.
- 6.3 For source testing performed pursuant to Section 3.4, compliance with an applicable standard or numerical limitation of this Rule shall be determined as defined by the test methods listed ~~on~~in Section 6.1 of this Rule.