

SMAQMD BACT CLEARINGHOUSE

ACTIVE

CATEGORY Type: **BOILER**

BACT Category: Small Emitter BACT (PTE <10lb/day)

BACT Determination Number:	378	BACT Determination Date:	11/03/2024
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Equipment Information

Permit Number: 27992

Equipment Description: Boiler/Heater Natural Gas fired, ≥ 2 MMBtu/hr to < 5 MMBtu/hr

Unit Size/Rating/Capacity: ≥ 2 MMBtu/hr to < 5 MMBtu/hr

Equipment Location: SACRAMENTO LAUNDRY COMPANY
3750 PELL CIRCLE, SACRAMENTO, CA 95838

BACT Determination Information

District Contact: Jeff Quok **Phone No.:** (279) 207-1145 **Email:** jquok@airquality.org

ROCs	Standard:	Good combustion practice and use of natural gas
	Technology Description:	
	Basis:	Achieved in Practice
NOx	Standard:	See Technology Description
	Technology Description:	Any unit fired on natural gas, excluding fire-tube boilers, atmospheric units, and thermal fluid heaters: 9 ppmvd at 3% O2 ---- Any fire-tube boilers on natural gas: 7 ppmvd corrected to 3% O2 --- Atmospheric units and thermal fluid heaters: 12 ppmvd at 3% O2
	Basis:	Achieved in Practice
SOx	Standard:	Good combustion practice and use of natural gas
	Technology Description:	
	Basis:	Achieved in Practice
PM10	Standard:	Good combustion practice and use of natural gas
	Technology Description:	
	Basis:	Achieved in Practice
PM2.5	Standard:	Good combustion practice and use of natural gas
	Technology Description:	
	Basis:	Achieved in Practice
CO	Standard:	Firetube Boilers: 50 ppmvd at 3% O2 Watertube Boilers: 100 ppmvd at 3% O2

		Technology Description:	
		Basis:	Achieved in Practice
LEAD		Standard:	
		Technology Description:	
		Basis:	
Comments:			

Printed:

11/04/2024

SMAQMD BACT CLEARINGHOUSE

ACTIVE

CATEGORY Type: **BOILER**

BACT Category: Small Emitter BACT (PTE <10lb/day)

BACT Determination Number:	379	BACT Determination Date:	11/03/2024
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Equipment Information

Permit Number: N/A - Generic BACT Determination
Equipment Description: Boiler/Heater LPG Fired, ≥ 2 MMBtu/hr to < 5 MMBtu/hr
Unit Size/Rating/Capacity: ≥ 2 MMBtu/hr to < 5 MMBtu/hr
Equipment Location: N/A - Generic BACT Determination

BACT Determination Information

District Contact: Jeff Quok **Phone No.:** (279) 207-1145 **Email:** jquok@airquality.org

ROCs	Standard:	Good combustion practice and use of LPG
	Technology Description:	
	Basis:	Achieved in Practice
NOx	Standard:	Non-atmospheric units: 9 ppmvd at 3% O2 Atmospheric units: 12 ppmvd at 3% O2
	Technology Description:	Low NOx Burner
	Basis:	Achieved in Practice
SOx	Standard:	Good combustion practice and use of LPG
	Technology Description:	
	Basis:	Achieved in Practice
PM10	Standard:	Good combustion practice and use of LPG
	Technology Description:	
	Basis:	Achieved in Practice
PM2.5	Standard:	Good combustion practice and use of LPG
	Technology Description:	
	Basis:	Achieved in Practice
CO	Standard:	Firetube Boilers: 50 ppmvd at 3% O2 Watertube Boilers: 100 ppmvd at 3% O2

		Technology Description:	
		Basis:	Achieved in Practice
LEAD		Standard:	
		Technology Description:	
		Basis:	
Comments:		This is a generic BACT determination based on BACT determinations made, and published, by other air agencies in California and/or other States.	

Printed:

11/04/2024



BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION

DETERMINATION NOS.: 378 & 379
DATE: 11/3/2024
ENGINEER: Jeffrey Quok

Category/General Equip Description: Boiler/Heater – Natural Gas or LPG Fired

#378 – Boiler/Heater Natural Gas fired,
≥ 2 MMBtu/hr to < 5 MMBtu/hr

#379 – Boiler/Heater LPG Fired, ≥ 2 MMBtu/hr to < 5
MMBtu/hr

Equipment Specific Description: _____

Equipment Size/Rating: Small Emitter

Previous BACT Det. No.: 309 & 310

This BACT/T-BACT determination will update BACT Determinations #309 & #310 which were made on 7/20/2022.

This determination will focus on natural gas and LPG boilers/heaters, greater than or equal to 2 MMBtu/hr to less than 5 MMBtu/hr, which include external combustion equipment used to produce hot water or steam and units which transfer heat from combustion gases to water or process streams. Heaters do not include any dryer in which the material being dried is in direct contact with the products of combustion, cement or lime kilns, glass melting furnaces, or smelters.

The District’s Small Emitter and “Otherwise-Exempt Equipment” BACT Determinations policy (dated 5/16/2019) states that units which are classified as small emitters (less than 10 lbs/day of VOC, NOx, SOx, PM10, or PM2.5 and less than 550 lbs/day of CO) and are located at non-major stationary sources are only required to meet BACT standards that have been achieved in practice. Therefore, this BACT determination will only be based on what is achieved in practice and will only be applied to small emitters at non-major sources. BACT will be evaluated on a case-by-case basis for units that do not fit these criteria.

BACT/T-BACT ANALYSIS

A. ACHIEVED IN PRACTICE (Rule 202, §205.1a):

The following control technologies are currently employed as BACT/T-BACT for boilers/heaters 2 MMBtu/hr to less than 5 MMBtu/hr by the following air pollution control districts:

US EPA

BACT

Source: [EPA RACT/BACT/LAER Clearinghouse](#) (See Attachment A)

RBL ID: [CA-1190](#)

For natural gas and LPG/propane fired units with a rating of ≥ 2 to <5 MMBtu/hr	
VOC	No standard
NOx	12 ppmvd corrected to 3% O ₂
SOx	No standard
PM10	No standard
PM2.5	No standard
CO	No standard

This BACT determination was found to be the most stringent Achieved in Practice BACT determination published in the EPA clearinghouse. See Attachment A for more information. The BACT determination was made by Santa Barbara County APCD.

T-BACT

There are no T-BACT standards published in the clearinghouse for this category.

RULE REQUIREMENTS:

None.

California Air Resource Board (CARB)

BACT

Source: [ARB BACT Clearinghouse](#)

[CARB BACT Guidelines Search](#)

The CARB BACT Guidelines search contained BACTs from BAAQMD, SMAQMD, and SCAQMD that will be reviewed in the specific District evaluations in this Determination.

[ATC 13623 \(6-7-11\) SBCAPCD](#)

For non-atmospheric natural gas units with a rating of ≥ 2 to < 5 MMBtu/hr	
VOC	No BACT determinations found for VOC in the ≥ 2 to < 5 MMBtu/hr range.
NOx	12 ppmvd corrected to 3% O ₂ [SBCAPCD]
SOx	No BACT determinations found for SOx in the ≥ 2 to < 5 MMBtu/hr range.
PM10	No BACT determinations found for PM10 in the ≥ 2 to < 5 MMBtu/hr range.

For non-atmospheric natural gas units with a rating of ≥ 2 to < 5 MMBtu/hr	
PM2.5	No BACT determinations found for PM2.5 in the ≥ 2 to < 5 MMBtu/hr range.
CO	100 ppmvd corrected to 3% O ₂ [SBCAPCD]

No BACT determinations found for atmospheric units in the ≥ 2 to < 5 MMBtu/hr range.

[ATC 12949-01 \(1-24-12\) SBAPCD](#)

For LPG/propane fired units with a rating of ≥ 2 to < 5 MMBtu/hr	
VOC	No standard
NOx	20 ppmvd corrected to 3% O ₂ [SBCAPCD]
SOx	No standard
PM10	No standard
PM2.5	No standard
CO	No standard

T-BACT

Source: [ARB BACT Clearinghouse](#)
[CARB BACT Guidelines Search](#)

There are no T-BACT standards published in the clearinghouse for this category.

RULE REQUIREMENTS:

None.

Sacramento Metropolitan AQMD

BACT

Source: [SMAQMD BACT Clearinghouse \(BACT #309 & #310\)](#)

BACT #309: For boilers/heaters ≥ 2 to < 5 MMBtu/hr, fired on natural gas	
VOC	Good combustion practice and use of natural gas
NOx	Any unit fired on natural gas, excluding fire-tube boilers, atmospheric units, and thermal fluid heaters: 9 ppmvd at 3% O ₂ Any fire-tube boilers on natural gas: 7 ppmvd corrected to 3% O ₂ Atmospheric units and thermal fluid heaters: 12 ppmvd at 3% O ₂
SOx	Good combustion practice and use of natural gas

BACT #309: For boilers/heaters ≥ 2 to < 5 MMBtu/hr, fired on natural gas	
PM10	Good combustion practice and use of natural gas
PM2.5	Good combustion practice and use of natural gas
CO	Fire-tube Boilers: 50 ppmvd at 3% O ₂ Water-tube Boilers: 100 ppmvd at 3% O ₂

BACT #310: For boilers/heaters ≥ 2 to < 5 MMBtu/hr, fired on LPG	
VOC	Good combustion practice and use of LPG
NOx	Non-atmospheric units: 9 ppmvd at 3% O ₂ Atmospheric units: 12 ppmvd at 3% O ₂
SOx	Good combustion practice and use of LPG
PM10	Good combustion practice and use of LPG
PM2.5	Good combustion practice and use of LPG
CO	Fire-tube Boilers: 50 ppmvd at 3% O ₂ Water-tube Boilers: 100 ppmvd at 3% O ₂

T-BACT

No T-BACT Determinations for this category in the Clearinghouse.

RULE REQUIREMENTS:

[Rule 411 – NOx from Boilers, Process Heaters, and Steam Generators](#) (8-23-2007)

For units with a rating of ≥ 2 and < 5 MMBTU/hr, emissions shall not exceed the following levels:

1. 30 ppmvd of NOx corrected to 3% O₂
2. 400 ppmvd of CO corrected to 3% O₂

South Coast AQMD

BACT

Source: [SCAQMD BACT Guidelines for Non-Major Polluting Facilities, page 13 & 14](#)
 (2/2/2024)

For natural gas fired with a rating of > 2 and < 20 MMBTU/hr :	
VOC	No Standard

For natural gas fired with a rating of > 2 and < 20 MMBTU/hr :	
NOx	Compliance with SCAQMD Rules 1146 or 1146.1 (12-02-2016)
SOx	Natural Gas
PM10	Natural Gas
PM2.5	No standard
CO	Fire-tube Boiler: 50 ppmvd corrected to 3% O ₂ Water-tube Boiler: 100 ppmvd corrected to 3% O ₂

For propane fired with a rating of > 2 and < 20 MMBTU/hr :	
VOC	No Standard
NOx	≤ 12 ppmvd corrected to 3% O ₂
SOx	No Standard
PM10	No Standard
PM2.5	No standard
CO	Fire-tube Boiler: 50 ppmvd corrected to 3% O ₂ Water-tube Boiler: 100 ppmvd corrected to 3% O ₂

For Atmospheric^(A) unit with a rating of > 2 and ≤ 10 MMBTU/hr :	
VOC	No Standard
NOx	Compliance with SCAQMD Rules 1146 or 1146.1 (12-02-2016) (12 ppmvd corrected to 3% O ₂ or 0.015 lbs/10 ⁶ BTU)
SOx	No Standard
PM10	No Standard
PM2.5	No standard
CO	Compliance with SCAQMD Rules 1146 or 1146.1 (12-02-2016) (400 ppm corrected to 3% O ₂ or 0.3 lbs/10 ⁶ BTU)

(A) Atmospheric unit is defined as natural gas fired unit with a heat input less than or equal to 10 MMBtu/hr with a non-sealed combustion chamber in which natural draft is used to exhaust combustion gases.

T-BACT

There are no T-BACT standards published in the clearinghouse for this category.

RULE REQUIREMENTS:

[Reg XI, Rule 1146.1 – Emissions of Oxides of Nitrogen from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters \(12-7-2018\)](#)

Requirements Table 1146.1-1

Category	NOx Limit for Units ≥ 5 MMBTU/hr
Atmospheric Units	12 ppmvd @ 3% O ₂ or 0.015 lbs/10 ⁶ BTU
Any unit fired on natural gas, excluding fire-tube boilers subject to (c)(1)(F), atmospheric units and thermal fluid heaters	9 ppmvd @ 3% O ₂ or 0.011 lbs/10 ⁶ BTU
Any fire-tube boilers fired on natural gas, excluding units with less than or equal to 12 ppm and greater than 9 ppm prior to 12/7/18	7 ppm @ 3% O ₂ or 0.0085 lbs/10 ⁶ Btu
Thermal Fluid Heaters	12 ppmvd @ 3% O ₂ or 0.015 lbs/10 ⁶ Btu
All other Units (A)	30 ppmvd @ 3% O ₂ or 0.036 lbs/10 ⁶ Btu

(A) All other units would include LPG/propane fired units (excluding atmospheric units and thermal fluid heaters).

All units rated greater than or equal to 5 MMBtu/hr must have CO emissions ≤ 400 ppmvd @ 3% O₂.

San Joaquin Valley APCD

BACT

Source: [SJVAPCD BACT Clearinghouse](#)

There are no BACT standards published in the clearinghouse for this category

Note: SJVUAPCD BACT Guidelines do not contain a determination for boilers 5 MMBtu/hr or less, since these units are not required to obtain a written permit, pursuant to SJVUAPCD Rule 2020 - Exemptions.

SJVUAPCD Rule 2020 §6.0

No Authority to Construct or Permit to Operate shall be required for (§6.1) steam generators, steam super heaters, water boilers, water heaters, steam cleaners, and closed indirect heat transfer systems that have a maximum input heat rating of 5,000,000 Btu per hour (gross) or less and is equipped to be fired exclusively with (§6.1.1.1) natural gas, (§6.1.1.2) liquefied petroleum gas, or (§6.1.1.3) any combination of the two.

T-BACT

There are no T-BACT standards published in the clearinghouse for this category.

RULE REQUIREMENTS:

[Rule 4307 – Boilers, Steam Generators, and Process Heaters – 2.0 MMBtu/hr to 5.0 MMBtu/hr \(4-21-2016\)](#)

Type (Gaseous or Liquid Fuel Fired)	NOx Limit ppmvd @ 3% O₂	CO Limit ppmvd @ 3% O₂	Effective Date
New or replacement atmospheric units not listed below	12 or 0.014 lb/MMBtu	400	1/1/2010
New or replacement atmospheric unit that is one of the following: <ul style="list-style-type: none"> - A unit used at a school, or - A unit in an oil field or refinery, or - A glycol reboiler, or - A unit with a heat input of 1.8 to 5.0 billion Btu per calendar year. 	12 or 0.014 lb/MMBtu	400	1/1/2016
New or replacement non-atmospheric units not listed below	9 or 0.011 lb/MMBtu	400	1/1/2010
New or replacement non-atmospheric unit that is one of the following: <ul style="list-style-type: none"> - A unit used at a school, or - A unit in an oil field or refinery, or - A glycol reboiler, or - A unit with a heat input of 1.8 to 5.0 billion Btu per calendar year. 	9 or 0.011 lb/MMBtu	400	1/1/2016

San Diego County APCD

BACT

Source: [NSR Requirements for BACT \(11/2023\)](#)

There are no BACT standards published in the clearinghouse for this category.

Note: SDCAPCD BACT Guidelines do not contain a specific determination for boilers/heaters in the size range of 2 to less than 5 MMBtu/hr, since these units are not required to obtain a written permit, pursuant to SDAPCD Regulation II Rule 11 – Exemptions from Rule 10 Permit Requirements.

SDAPCD Rule 11(d)

Any equipment, operation, or process that is listed below in Subsections (d)(1) through (d)(20), and that meets the stated exemption provision, parameter, requirement, or limitation, is exempt from the requirements of Rule 10. (d)(2)(v) Any boiler, process heater, or steam generator with a manufacturer’s maximum gross heat input rating of less than 5 million BTU per hour fired exclusively with natural gas and/or liquefied petroleum gas.

The SDCAPCD has a BACT determination that applies to natural gas or propane fired boilers/heaters with a rating of less than 50 MMBtu/hr. The SDCAPCD has a BACT trigger level of 10.0 lbs/day for NOx, VOC, SOx and PM10. No limits have been established for PM2.5 or CO. Since, boilers in the size range of 2 to less than 5 MMBtu/hr are exempt from permit requirements, this BACT guideline does not apply.

T-BACT

There are no T-BACT standards published in the clearinghouse for this category.

RULE REQUIREMENTS:

[Regulation 4, Rule 69.2.1 – Small Boilers, Process Heaters, Steam Generators and Large Water Heaters \(7-01-2021\)](#)

This rule applies to any unit with a heat input rating from 75,000 Btu/hr to 2 MMBtu/hr. (Note that for this BACT determination only units rated exactly at 2 MMBtu/hr would apply)

Equipment Type	Fuel	Heat Input Rating (Btu per hour)	Concentration of NOx (ppmv at 3% O₂)	Concentration of CO (ppmv at 3% O₂)
New Unit	Natural Gas	Greater than 400,000 to 2,000,000	20	400
New Unit	Non PUC gas or Liquid Fuel	Greater than 400,000 to 2,000,000	30	400

[Regulation 4, Rule 69.2.2 – Medium Boilers, Process Heaters and Steam Generators \(9-09-2021\)](#)

This rule applies to any unit with a heat input rating greater than 2 MMBtu/hr to less than 5 MMBtu/hr.

Equipment Type	Fuel	Heat Input Rating (Btu per hour)	Concentration of NOx (ppmv at 3% O₂)	Concentration of CO (ppmv at 3% O₂)
New Unit	Gaseous Fuel	Greater than 2,000,000 to less than 5 MMBtu/hr	30	400

Bay Area AQMD

BACT

Source: [BAAQMD BACT Workbook](#)

Note: BAAQMD BACT Workbook does not contain a determination for boilers/heaters 5 MMBtu/hr or less fired exclusively on natural gas or LPG, since these units are not required

to obtain a written permit, pursuant to BAAQMD Regulation 2, Rule 1 – General Requirements.

[BAAQMD Rule 2-1-114 – General Requirements](#)

The following equipment is exempt from the requirements of Sections 2-1-301 and 302 (requirement to obtain an ATC or PTO): (114.1) Boilers, Heaters, Steam Generators, Duct Burners, and Similar Combustion Equipment:

- 1.2 Any of the above equipment with less than 10 million BTU per hour rated heat input if fired exclusively with natural gas (including compressed natural gas), liquefied petroleum gas (e.g. propane, butane, isobutane, propylene, butylenes, and their mixtures), or any combination thereof.

T-BACT

There are no T-BACT standards published in the clearinghouse for this category.

RULE REQUIREMENTS:

[Regulation 9, Rule 6 – Nitrogen Oxides Emissions from Natural Gas-Fired Water Heaters \(3-15-2023\)](#)

For units with a rating of 400,001 Btu/hr to 2 MMBtu/hr:

1. Manufactured after 1/1/2008: NO_x limit of 30 ppmvd corrected to 3% O₂.
2. Manufactured after 1/1/2013: NO_x limit of 20 ppmvd corrected to 3% O₂.
3. Manufactured after 1/1/2031: NO_x limit of 0 ppmvd corrected to 3% O₂.

BAAQMD's zero NO_x standard phase out date of 1/1/2031 is based on BAAQMD's current understanding of available technology accessibility, and current barriers to an immediate effective date. The standards would apply when appliances are replaced upon burnout. Only appliances that meet the new standard could be sold and installed in the Bay Area upon implementation. Since the zero NO_x standard does not go into effect until 1/1/2031, the standard will not be considered achieved in practice for this BACT Determination.

[Regulation 9, Rule 7 – Nitrogen Oxides and Carbon Monoxide from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters \(5-4-2011\)](#)

For gaseous fuel combustion units, except landfill or digester gas units, with a rating of greater than 2 MMBtu/hr and less than or equal to 5 MMBtu/hr:

1. NO_x limit of 30 ppmvd corrected to 3% O₂
2. CO limit of 400 ppmvd corrected to 3% O₂

Summary of Achieved in Practice Control Technologies

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

SUMMARY OF ACHIEVED IN PRACTICE CONTROL TECHNOLOGIES	
VOC	<p><u>For Natural Gas Fired Units</u></p> <ol style="list-style-type: none"> 1. Good combustion practice and use of natural gas – [SMAQMD] 2. No standard – [EPA, ARB, SCAQMD, SDAPCD, BAAQMD, SJVAPCD] <p><u>For LPG/Propane Fired Units</u></p> <ol style="list-style-type: none"> 1. Good combustion practice and use of LPG – [SMAQMD] 2. No standard – [EPA, ARB, SCAQMD, SDAPCD, BAAQMD, SJVAPCD]
NOx	<p><u>For Natural Gas Fired Units</u></p> <ol style="list-style-type: none"> 1. Any unit fired on natural gas, excluding fire-tube boilers, atmospheric units, and thermal fluid heaters: 9 ppmvd corrected to 3% O₂ Any fire-tube boilers on natural gas: 7 ppmvd corrected to 3% O₂ Atmospheric units & Thermal Fluid Heaters: 12 ppmvd corrected to 3% O₂ – [SCAQMD, SMAQMD] 2. Non-atmospheric: 9 ppmvd corrected to 3% O₂ Atmospheric: 12 ppmvd corrected to 3% O₂ – [SJVUAPCD] 3. 12 ppmvd corrected to 3% O₂ – [EPA, ARB, SBCAPCD] 4. 20 ppmvd corrected to 3% O₂ for units equal to 2.0 MMBtu/hr 30 ppmvd corrected to 3% O₂ for units greater than 2.0 to less than 5.0 MMBtu/hr – [SDAPCD, BAAQMD] <p><u>For LPG/Propane Fired Units</u></p> <ol style="list-style-type: none"> 1. Non-atmospheric: 9 ppmvd corrected to 3% O₂ Atmospheric: 12 ppmvd corrected to 3% O₂ – [SJVUAPCD, SMAQMD] 2. 12 ppmvd corrected to 3% O₂ – [EPA, SCAQMD] 3. 20 ppmvd corrected to 3% O₂ - [ARB, SBAPCD] 4. 30 ppmvd corrected to 3% O₂ - [SDAPCD, BAAQMD]
SOx	<p><u>For Natural Gas Fired Units</u></p> <ol style="list-style-type: none"> 1. Good combustion practice and use of natural gas – [SMAQMD] 2. Natural gas – [SCAQMD] 3. No standard – [EPA, ARB, SDAPCD, BAAQMD SJVUAPCD] <p><u>For LPG/Propane Fired Units</u></p> <ol style="list-style-type: none"> 1. Good combustion practice and use of LPG – [SMAQMD] 2. No standard – [EPA, ARB, SCAQMD, SDAPCD, BAAQMD, SJVUAPCD]

SUMMARY OF ACHIEVED IN PRACTICE CONTROL TECHNOLOGIES	
PM10	<p><u>For Natural Gas Fired Units</u></p> <ol style="list-style-type: none"> 1. Good combustion practice and use of natural gas – [SMAQMD] 2. Natural gas – [SCAQMD] 3. No standard – [EPA, ARB, SDAPCD, BAAQMD SJVUAPCD] <p><u>For LPG/Propane Fired Units</u></p> <ol style="list-style-type: none"> 1. Good combustion practice and use of LPG – [SMAQMD] 2. No standard – [EPA, ARB, SCAQMD, SDAPCD, BAAQMD, SJVUAPCD]
PM2.5	<p><u>For Natural Gas Fired Units</u></p> <ol style="list-style-type: none"> 1. Good combustion practice and use of natural gas – [SMAQMD] 2. No standard – [EPA, ARB, SCAQMD, SDAPCD, BAAQMD SJVUAPCD] <p><u>For LPG/Propane Fired Units</u></p> <ol style="list-style-type: none"> 1. Good combustion practice and use of LPG – [SMAQMD] 2. No standard – [EPA, ARB, SCAQMD, SDAPCD, BAAQMD, SJVUAPCD]
CO	<p><u>For Natural Gas Fired Units</u></p> <ol style="list-style-type: none"> 1. Fire-tube Boilers: 50 ppmvd corrected to 3% O₂, and Water-tube Boilers: 100 ppmvd corrected to 3% O₂ – [SMAQMD, SCAQMD] 2. 100 ppmvd corrected to 3% O₂ – [ARB, SBCAPCD] 3. 400 ppm of CO corrected to 3% O₂ – [SDAPCD, BAAQMD, SJVAPCD] 4. No standard – [EPA] <p><u>For LPG/Propane Fired Units</u></p> <ol style="list-style-type: none"> 1. Fire-tube Boilers: 50 ppmvd corrected to 3% O₂, and Water-tube Boilers: 100 ppmvd corrected to 3% O₂ – [SMAQMD, SCAQMD] 2. 400 ppm of CO corrected to 3% O₂ – [SDAPCD, BAAQMD, SJVAPCD] 3. No standard – [EPA, ARB]

The following control technologies have been identified as the most stringent, achieved in practice control technologies:

BEST CONTROL TECHNOLOGIES ACHIEVED BACT #378 – Boiler/heater natural gas fired, ≥ 2 MMBtu/hr to < 5 MMBtu/hr		
Pollutant	Standard	Source
VOC	Good combustion practice and use of natural gas	SMAQMD
NOx	Any unit fired on natural gas, excluding fire-tube boilers, atmospheric units, and thermal fluid heaters: 9 ppmvd at 3% O ₂ Any fire-tube boilers on natural gas: 7 ppmvd corrected to 3% O ₂ Atmospheric units and thermal fluid heaters: 12 ppmvd at 3% O ₂	SCAQMD, SMAQMD
SOx	Good combustion practice and use of natural gas	SMAQMD
PM10	Good combustion practice and use of natural gas	SMAQMD
PM2.5	Good combustion practice and use of natural gas	SMAQMD
CO	Fire-tube Boilers: 50 ppmvd at 3% O ₂ Water-tube Boilers: 100 ppmvd at 3% O ₂	SMAQMD, SCAQMD

BEST CONTROL TECHNOLOGIES ACHIEVED BACT #379 – Boiler/heater LPG fired, ≥ 2 MMBtu/hr to < 5 MMBtu/hr		
Pollutant	Standard	Source
VOC	Good combustion practice and use of LPG	SMAQMD
NOx	Non-atmospheric units: 9 ppmvd at 3% O ₂ Atmospheric units: 12 ppmvd at 3% O ₂	SJVAPCD, SMAQMD
SOx	Good combustion practice and use of LPG	SMAQMD
PM10	Good combustion practice and use of LPG	SMAQMD
PM2.5	Good combustion practice and use of LPG	SMAQMD
CO	Fire-tube Boilers: 50 ppmvd at 3% O ₂ Water-tube Boilers: 100 ppmvd at 3% O ₂	SMAQMD, SCAQMD

B. TECHNOLOGICALLY FEASIBLE AND COST EFFECTIVE (Rule 202, §205.1.b.):

As stated previously, the District’s Small Emitter and “Otherwise-Exempt Equipment” BACT Determinations policy (dated 5/16/2019) states that units which are classified as small emitters (less than 10 lbs/day of VOC, NOx, SOx, PM10, or PM2.5 and less than 550 lbs/day of CO) and are located at non-major stationary sources are only required to meet BACT standards that have been achieved in practice. Therefore, this BACT determination will only be based on what is achieved in practice and will only be applied to small emitters at non-major sources. BACT will be evaluated on a case-by-case basis for units that do not fit these criteria.

C. SELECTION OF BACT:

Based on the above analysis, BACT for VOC, NOx, SOx, PM10, PM2.5, and CO will be the most stringent standards of what is currently achieved in practice.

BACT #378 – Boiler/heater natural gas fired, ≥ 2 MMBtu/hr to < 5 MMBtu/hr		
Pollutant	Standard	Source
VOC	Good combustion practice and use of natural gas	SMAQMD
NOx	Any unit fired on natural gas, excluding fire-tube boilers, atmospheric units, and thermal fluid heaters: 9 ppmvd at 3% O ₂ Any fire-tube boilers on natural gas: 7 ppmvd corrected to 3% O ₂ Atmospheric units and thermal fluid heaters: 12 ppmvd at 3% O ₂	SCAQMD, SMAQMD
SOx	Good combustion practice and use of natural gas	SMAQMD
PM10	Good combustion practice and use of natural gas	SMAQMD
PM2.5	Good combustion practice and use of natural gas	SMAQMD
CO	Fire-tube Boilers: 50 ppmvd at 3% O ₂ Water-tube Boilers: 100 ppmvd at 3% O ₂	SCAQMD, SMAQMD

BACT #379 – Boiler/heater LPG fired, ≥ 2 MMBtu/hr to < 5 MMBtu/hr		
Pollutant	Standard	Source
VOC	Good combustion practice and use of LPG	SMAQMD
NO _x	Non-atmospheric units: 9 ppmvd at 3% O ₂ Atmospheric units: 12 ppmvd at 3% O ₂	SJVAPCD, SMAQMD
SO _x	Good combustion practice and use of LPG	SMAQMD
PM ₁₀	Good combustion practice and use of LPG	SMAQMD
PM _{2.5}	Good combustion practice and use of LPG	SMAQMD
CO	Fire-tube Boilers: 50 ppmvd at 3% O ₂ Water-tube Boilers: 100 ppmvd at 3% O ₂	SCAQMD, SMAQMD

D: SELECTION OF T-BACT:

Toxics are in the form of VOCs and particulate matter. Since toxic emissions from natural gas/LPG fired boilers in the ≥ 2 MMBtu/hr to < 5 MMBtu/hr size range are so small and the cancer risk is expected to be well below 1 in a million, T-BACT was not evaluated for this determination.

APPROVED BY: *Brian F Krebs* DATE: 11-03-2024

Attachment A


Review of BACT Determinations published by EPA

List of BACT determinations published in EPA's RACT/BACT/LAER Clearinghouse (RBLC) for Commercial/Institutional-Sized Boilers/Furnaces < 100 Million BTU/H - Natural Gas (includes propane & liquefied petroleum gas) (Process Code 13.310):

Boilers/Heaters 2.0 - < 5.0 MMBTU/hr							
RBLC#	Permit Date^(A)	Rating	Fuel	Pollutant	Standard	Control Technology	Case-By-Case Basis
MI-0435	7/16/2018	3.8 MMBTU/hr	Natural gas	NOx	0.14 lb/hr	Low NOx burner	BACT-PSD
				CO	0.14 lb/hr	Good Combustion Controls	BACT-PSD
				PM10	0.03 lb/hr	Low sulfur fuel	BACT-PSD
				PM2.5	0.03 lb/hr	Low sulfur fuel	BACT-PSD
				VOC	0.03 lb/hr	Good Combustion Controls	BACT-PSD
MI-0426	3/24/2017	3 MMBTU/hr	Natural gas	CO	84 lb/MMSCF	Good combustion practices and clean burn fuel (pipeline quality NG)	BACT-PSD
				NOx	20 PPM @ 3% O2	Ultra-low NOx burners and good combustion practices	BACT-PSD
				PM10/PM2.5	0.52 lb/MMSCF	Good combustion practices and clean burn fuel (pipeline quality NG)	BACT-PSD
MI-0424	12/5/2016	3.7 MMBtu/hr	Natural gas	CO	0.41 lb/hr	Good combustion practices	BACT-PSD
				NOx	0.55 lb/hr	Good combustion practices	BACT-PSD
				PM10/PM2.5	0.0075 lb/MMBtu	Good combustion practices	BACT-PSD
				VOC	0.03 lb/hr	Good combustion practices	BACT-PSD

Boilers/Heaters 2.0 - < 5.0 MMBTU/hr							
RBLC#	Permit Date ^(A)	Rating	Fuel	Pollutant	Standard	Control Technology	Case-By-Case Basis
CA-1189	1/24/12	2.0 MMBtu/hr	Propane, field gas, PUC, natural gas	NOx	20 ppmvd @ 3% O2	Low NOx Burner	OTHER CASE-BY-CASE
CA-1190	1/24/12	3.0 MMBtu/hr	Propane, field gas, PUC, natural gas	NOx	12 ppmvd @ 3% O2	Low NOx Burner	OTHER CASE-BY-CASE

(A) Due to the large number of entries only determinations made (based on Permit Date) entered since 01/01/2012 are included in the above table.

 = Selected as the most stringent BACT determination achieved in practice.



https://cfpub.epa.gov/rblc/index.cfm?action=PermitDetail.ProcessInfo&facility_id=27288&PROCESS_ID=108063
Last updated on 4/8/2016

Technology Transfer Network

Clean Air Act Home | On-line Radiation | TNW | RACT/BACT/LAER Clearinghouse | Clean Air Technology Center
[RACT/BACT/LAER Clearinghouse](#) [RBLC Basic Search](#) [RBLC Search Results](#) [Process Information - Details](#)

Process Information - Details

For information about the pollutants related to this process, click on the specific pollutant in the list below.

- [RBLC Home](#)
- [New Search](#)
- [Search Results](#)
- [Facility Information](#)
- [Process List](#)
- [Process Information](#)

[Help](#)

FINAL

RBLC ID: CA-1190
Corporate/Company: PETROROCK- TUNNELL LEASE
Facility Name: PETROROCK- TUNNELL LEASE
Process: Heater

Primary Fuel: Propane, field gas, PUC natural gas
Throughput: 3.00 MMBTU/H
Process Code: 13.310

Pollutant Information - List of Pollutants

[Help](#)

Pollutant	Primary Emission Limit	Basis	Verified
<u>Nitrogen Oxides (NOx)</u>	12.0000 PPMVD@3%	OTHER	UNKNOWN
	O2	CASE-BY-CASE	

Process Notes:



https://cfpub.epa.gov/rblc/index.cfm?action=PermitDetail.FacilityInfo&facility_id=27288
Last updated on 4/8/2016

Technology Transfer Network

[Clean Air EPA Home](#) [Micro Radiation](#) [IT NWS](#) [Technology Transfer Network](#) [Clean Air Technology Center](#)
[RACT/BACT/LAER Clearinghouse](#) [RBLC Basic Search](#) [RBLC Search Results](#) [Facility Information](#)

Facility Information

To learn more about the processes associated with this facility, click the Process List button. You can then view pollutant information for each process.

[RBLC Home](#) [New Search](#) [Search Results](#) [Facility Information](#) [Process List](#)

[Help](#)

Date Entered:04/23/2012

Date Last Modified:09/06/2012

FINAL

RBLC ID: CA-1190
Corporate/Company: PETROROCK- TUNNELL LEASE
Facility Name: PETROROCK- TUNNELL LEASE
Facility Description:

State: CA
County: SANTA BARBARA
EPA Region: 9

Zip Code: 93454
Country: USA

Facility Contact Information:

Name:
Phone: **E-Mail:**

Agency Contact Information:

Agency: CA033 - SANTA BARBARA COUNTY APCD, CA
Contact: MR. BEN ELLENBERGER
Address: SANTA BARBARA COUNTY AIR
POLLUTION CONTROL DISTRICT
260 NORTH SAN ANTONIO RD.
SUITE A.
SANTA BARBARA, CA 93110-1315
Phone: (805) 961-8879
Other Agency
Contact Info: 805-961-8800

[EXIT Disclaimer](#) [Agency Link](#)

Permit Number: ATC- 12949-01 (3)

Permit Type: B: Add new process to existing facility

PERMIT URL:

EST/ACT DATE
Complete
Application ACT 03/07/2011
Date:
Permit
Issuance ACT 01/24/2012
Date:
FRS Number: Not Available
SIC Code: 1311
NAICS Code: 211111

Affected Class I / U.S. Border Area:

No affected Class 1 areas identified.

Facility-Wide Emission Increase/Decrease:
(After prevention/control measures)

No facilitywide emissions data available for this facility.

Other Permitting Information:

Attachment B

Review of BACT Determinations published by CARB

List of BACT determinations published in CARB's BACT Clearinghouse for boilers ≥ 2 MMBtu/hr to < 5 MMBtu/hr:

Capacity MMBtu/hr	Source	Date	Type	NOx ppmv @ 3% O ₂	CO ppmv @ 3% O ₂	VOC lbs/MMBtu	Filterable PM10 lbs/MMBtu	SO ₂ lbs/MMBtu
3.00	SANTA BARBARA COUNTY APCD	6/7/2011	Non- Atmospheric	12	100	NA	NA	NA
2.00	SANTA BARBARA COUNTY APCD	1/24/2012	Not Specified	20	NA	NA	NA	NA



Selected as the most stringent BACT determination achieved in practice

ATTACHMENT
BACT Documentation

1. Pollutant(s): NO_x
2. Emission Unit: The Cleaver-Brooks boilers rated at 3.00 MMBtu/hr, Serial No: 02207-1-1, and 02207-1-2. Emission Controls: Low NO_x burner. PUC quality natural gas fired.
3. BACT Determination Summary:

Technology 1: Low NO_x burner (PUC quality natural gas)
Performance Standard: 12 ppmvd at 3 percent oxygen for NO_x
100 ppmvd at 3 percent oxygen for CO
4. Level of Stringency: Achieved in Practice
 Technologically Feasible
 RACT, BARCT, NSPS, NESHAPS, MACT
5. BACT Selection Process Discussion: Achieved in Practice determination based on SCAQMD BACT Guidelines for boilers rated between 2.0 MMBtu/hr and 5.0 MMBtu/hr.
6. BACT Effectiveness: BACT is expected to be effective overall operating loads.
7. BACT During Non-Standard Operations: Non-standard operations were not identified by the applicant.
8. Operating Constraints: The boilers are required to operate with low NO_x burners.
9. Continuously Monitored BACT: CEMS are not required for this project.
10. Source Testing Requirement: Initial source testing is required for NO_x, ROC, and CO while fired on PUC quality natural gas. Subsequent source testing required upon District request.
11. Compliance Averaging Times: The concentration limits shall be enforced based on the approved source test procedures (the average of three 40-minute runs).
12. Multi-Phase Projects: This is not a multi-year project.
13. Referenced Documents: The SCAQMD BACT Guidelines are found online at:
SCAQMD BACT Guidelines: <http://www.aqmd.gov/bact/BACTGuidelines.htm>
14. PSD BACT: Not Applicable.

Attachment C

**Review of BACT Determinations published by California
Air Districts**

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
Best Available Control Technology (BACT) Guidelines for Non-Major Polluting Facilities*

10-20-2000 Rev. 0
 10-03-2008 Rev. 1
 12-02-2016 Rev. 2
 2-1-2019 Rev. 3

Equipment or Process: Boiler

Subcategory/Rating/Size	Criteria Pollutants					Inorganic
	VOC	NOx ¹	SOx	CO	PM ₁₀	
Natural Gas Fired, > 2 and < 20 MMBtu/HR		Compliance with Rules 1146 or 1146.1 ² (12-02-2016)	Natural Gas (10-20-2000)	≤50 ppmvd for firetube type, ≤ 100 ppmvd for watertube type, corrected to 3% O ₂ (04-10-98)	Natural Gas (04-10-98)	
Propane Fired, > 2 and < 20 MMBtu/HR		≤ 12 ppmvd corrected to 3% O ₂ ² (10-20-2000)		≤50 ppmvd for firetube type, ≤ 100 ppmvd for watertube type, corrected to 3% O ₂ (04-10-98)		
Natural Gas or Propane Fired, ≥ 20 and < 75 MMBtu/HR		Compliance with Rule 1146 (2-1-2019)	Natural Gas (10-20-2000)	Same as above. (04-10-98)	Natural Gas (04-10-98)	With Add-On Controls: ≤ 5 ppmvd NH ₃ , corrected to 3% O ₂ ≤ 1 ppmvd ozone, corrected to 3% O ₂ (10-20-2000)
Natural Gas or Propane Fired, ≥ 75 MM Btu/HR		Compliance with Rule 1146 (12-02-2016)	Natural Gas (10-20-2000)	Same as above. (04-10-98)	Natural Gas (04-10-98)	With Add-On Controls: ≤ 5 ppmvd NH ₃ , corrected to 3% O ₂ ≤ 1 ppmvd ozone, corrected to 3% O ₂ (10-20-2000)

* Means those facilities that are minor facilities as defined by Rule 1302 - Definitions

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
Best Available Control Technology (BACT) Guidelines for Non-Major Polluting Facilities*

Subcategory/Rating/ Size	Criteria Pollutants					Inorganic
	VOC	NO _x ¹	SO _x	CO	PM ₁₀	
Oil Fired ³		Compliance with Rule 1146 or 1146.1 (10-20-2000)	Fuel Sulfur Content ≤ 0.0015% by weight (10-03-2008)	≤ 50 ppmvd for firetube type ≤ 100 ppmvd for watertube type, corrected to 3% O ₂ (04-10-98)		
Atmospheric Unit, ≥ 2 and ≤ 10 MMBtu/HR		Compliance with Rules 1146 and 1146.1 (12-02-2016)		Compliance with Rules 1146 and 1146.1 (12-02-2016)		
Landfill Gas Fired, < 75 MMBTU/Hr		Compliance with Rules 1146 and 1146.1 (12-02-2016)		≤ 100 ppmvd at 3% O ₂ dry. (04-10-98)	≤ 0.1 gr/scf at 12% CO ₂ (Rule 409) (04-10-98)	
Digester Gas Fired, < 75 MMBTU/Hr		Compliance with Rules 1146 and 1146.1 (12-02-2016)		≤ 100 ppmvd at 3% O ₂ dry. (04-10-98)	≤ 0.1 gr/scf at 12% CO ₂ (Rule 409) (04-10-98)	

- 1) Electric utility boilers, refinery boilers rated >40 MMBtu/hr and sulfur plant reaction boilers rated ≥5 MMBtu/hr are excluded; and there are exceptions for low-use boilers and boilers that met a 12-ppm limit prior to 9/5/08. Applicants are advised to review these rules for further details.
- 2) A higher NO_x limit may be allowed for facilities required to have a standby fuel, where use of a clean standby fuel is not possible and an ultra low-NO_x burner is not available.
- 3) See Clean Fuels Policy in Part C of the BACT Guidelines. Oil firing is only allowed as a standby fuel, and where use of a clean standby fuel is not possible.

* Means those facilities that are minor facilities as defined by Rule 1302 - Definitions

SMAQMD BACT CLEARINGHOUSE

ACTIVE

CATEGORY Type: **BOILER/HEATER < 5 MMBTU**

BACT Category: Boilers 2-5 MMBtu/hr Natural Gas

BACT Determination Number: 309	BACT Determination Date: 7/20/2022
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Equipment Information

Permit Number: N/A -- Generic BACT Determination
 Equipment Description: BOILER
 Unit Size/Rating/Capacity: Small Emitter BACT (PTE < 10 lb/day)
 Equipment Location:

BACT Determination Information

District Contact: Jeff Quok Phone No.: (279) 207-1145 email: jquok@airquality.org

ROCs	Standard:	Good combustion practice and use of natural gas
	Technology Description:	
	Basis:	Achieved in Practice
NOx	Standard:	See Comments
	Technology Description:	
	Basis:	Achieved in Practice
SOx	Standard:	Good combustion practice and use of natural gas
	Technology Description:	
	Basis:	Achieved in Practice
PM10	Standard:	Good combustion practice and use of natural gas
	Technology Description:	
	Basis:	Achieved in Practice
PM2.5	Standard:	Good combustion practice and use of natural gas
	Technology Description:	
	Basis:	Achieved in Practice
CO	Standard:	See Description Below
	Technology Description:	Firetube Boilers: 50 ppmvd at 3% O2 Watertube Boilers: 100 ppmvd at 3% O2
	Basis:	Achieved in Practice
LEAD	Standard:	
	Technology Description:	
	Basis:	

Comments: BACT for NOx:
 Any unit fired on natural gas, excluding fire-tube boilers, atmospheric units, and thermal fluid heaters: 9 ppmvd at 3% O2
 Any fire-tube boilers on natural gas: 7 ppmvd corrected to 3% O2
 Atmospheric units and thermal fluid heaters: 12 ppmvd at 3% O2

SMAQMD BACT CLEARINGHOUSE

ACTIVE

CATEGORY Type: **BOILER/HEATER < 5 MMBTU**

BACT Category: Boiler 2-5 MMBtu/hr LPG

BACT Determination Number: 310	BACT Determination Date: 7/20/2022
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Equipment Information

Permit Number: N/A -- Generic BACT Determination
 Equipment Description: BOILER
 Unit Size/Rating/Capacity: Small Emitter BACT (PTE < 10 lb/day)
 Equipment Location:

BACT Determination Information

District Contact: Jeff Quok Phone No.: (279) 207-1145 email: jquok@airquality.org

ROCs	Standard:	Good combustion practice and use of LPG
	Technology Description:	
	Basis:	Achieved in Practice
NOx	Standard:	See Comments
	Technology Description:	
	Basis:	Achieved in Practice
SOx	Standard:	Good combustion practice and use of LPG
	Technology Description:	
	Basis:	Achieved in Practice
PM10	Standard:	Good combustion practice and use of LPG
	Technology Description:	
	Basis:	Achieved in Practice
PM2.5	Standard:	Good combustion practice and use of LPG
	Technology Description:	
	Basis:	Achieved in Practice
CO	Standard:	See Description Below
	Technology Description:	Firetube Boilers: 50 ppmvd at 3% O2 Watertube Boilers: 100 ppmvd at 3% O2
	Basis:	Achieved in Practice
LEAD	Standard:	
	Technology Description:	
	Basis:	

Comments: BACT for NOx:
 Non-atmospheric units: 9 ppmvd at 3% O2
 Atmospheric units: 12 ppmvd at 3% O2