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

BACT Size: Small Emitter BACT (PTE < 10 lb/day) **BOILER**

BACT Determination Number:	136	**BACT Determination Date:**	**1/25/2017**

Equipment Information

Permit Number: N/A -- Generic BACT Determination
Equipment Description: BOILER
Unit Size/Rating/Capacity: >= 75,000 Btu/hr and < 2.0 MMBtu/hr fired on NG
Equipment Location:

BACT Determination Information

ROCs	**Standard:**	Good Combustion Practices
	Technology Description:	
	Basis:	Achieved in Pactice
NOx	**Standard:**	20ppm or pool/spa heaters < 400,000Btu/hr = 55ppm
	Technology Description:	Low NOx burner with good combustion practices
	Basis:	Achieved in Pactice
SOx	**Standard:**	Good Combustion Practices
	Technology Description:	
	Basis:	Achieved in Pactice
PM10	**Standard:**	Good Combustion Practices
	Technology Description:	
	Basis:	Achieved in Pactice
PM2.5	**Standard:**	Good Combustion Practices
	Technology Description:	
	Basis:	Achieved in Pactice
CO	**Standard:**	400 ppm
	Technology Description:	Low NOx burner with good combustion practices
	Basis:	Achieved in Pactice
LEAD	**Standard:**	
	Technology Description:	
	Basis:	

Comments: All units listed ppm are ppmvd corrected to 3% O2

District Contact: Joe Carle Phone No.: (916) 874 - 4838 email: jcarle@airquality.org

777 12th Street, Third Floor

SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT

Sacramento, CA 95814

BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION

DETERMINATION NO.: 136

DATE: 1/25/2017

ENGINEER: Joe Carle

Category/General Equip Description: Boiler/Heater – Natural gas

Equipment Specific Description: Boiler/heater greater or equal to 75,000 BTU/hr and less than 2.0 MMBTU/hr, fired on natural gas

Equipment Size/Rating: Small Emitter BACT (PTE < 10 lb/day)

Previous BACT Det. No.: 112

This BACT determination will update Determination #112 for boilers/heaters greater or equal to 75,000 BTU/hr and less than 2.0 MMBtu/hr, fired on natural gas.

BACT ANALYSIS

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

The following control technologies are currently employed as BACT for boilers/heaters greater or equal to 75,000 BTU/hr and less than 2.0 MMBTU/hr fueled by natural gas by the following air pollution control districts:

<table>
<tr><th>District/Agency</th><th>Best Available Control Technology (BACT)/Requirements</th></tr>
<tr><td>US EPA</td><td>
BACT
Source: EPA RACT/BACT/LAER Clearinghouse

<table>
<tr><td colspan="2">For units with a rating of 75,000 Btu/hr to < 2 MMBtu/hr</td></tr>
<tr><td>VOC</td><td>N/A – No BACT determinations found in the ≥ 0.075 to <2 MMBtu/hr range</td></tr>
<tr><td>NOx</td><td>N/A – No BACT determinations found in the ≥ 0.075 to <2 MMBtu/hr range</td></tr>
<tr><td>SOx</td><td>N/A – No BACT determinations found in the ≥ 0.075 to <2 MMBtu/hr range</td></tr>
<tr><td>PM10</td><td>N/A – No BACT determinations found in the ≥ 0.075 to <2 MMBtu/hr range</td></tr>
<tr><td>PM2.5</td><td>N/A – No BACT determinations found in the ≥ 0.075 to <2 MMBtu/hr range</td></tr>
<tr><td>CO</td><td>N/A – No BACT determinations found in the ≥ 0.075 to <2 MMBtu/hr range</td></tr>
</table>

RULE REQUIREMENTS:
None
</td></tr>
</table>

<table>
<tr><th>District/Agency</th><th>Best Available Control Technology (BACT)/Requirements</th></tr>
<tr><td>ARB</td><td>
<u>BACT</u>
Source: ARB BACT Clearinghouse

<table>
<tr><td colspan="2">For units with a rating of 75,000 Btu/hr to < 2 MMBtu/hr</td></tr>
<tr><td>VOC</td><td>N/A – No BACT determinations found in the ≥ 0.075 to <2 MMBtu/hr range</td></tr>
<tr><td>NOx</td><td>N/A – No BACT determinations found in the ≥ 0.075 to <2 MMBtu/hr range</td></tr>
<tr><td>SOx</td><td>N/A – No BACT determinations found in the ≥ 0.075 to <2 MMBtu/hr range</td></tr>
<tr><td>PM10</td><td>N/A – No BACT determinations found in the ≥ 0.075 to <2 MMBtu/hr range</td></tr>
<tr><td>PM2.5</td><td>N/A – No BACT determinations found in the ≥ 0.075 to <2 MMBtu/hr range</td></tr>
<tr><td>CO</td><td>N/A – No BACT determinations found in the ≥ 0.075 to <2 MMBtu/hr range</td></tr>
</table>

<u>RULE REQUIREMENTS</u>:
None
</td></tr>
<tr><td>SMAQMD</td><td>
<u>BACT</u>
Source: SMAQMD BACT #112

<table>
<tr><td colspan="2">For units with a rating of 75,000 Btu/hr to < 2 MMBtu/hr</td></tr>
<tr><td>VOC</td><td>Good combustion practice; Use of natural gas or LPG if natural gas is not available.</td></tr>
<tr><td>NOx</td><td>Pool/spa heaters: 55 ppmvd at 3% O_2
All other boilers/heaters: 20 ppmvd at 3% O2</td></tr>
<tr><td>SOx</td><td>Good combustion practice; Use of natural gas or LPG if natural gas is not available.</td></tr>
<tr><td>PM10</td><td>Good combustion practice; Use of natural gas or LPG if natural gas is not available.</td></tr>
<tr><td>PM2.5</td><td>Good combustion practice; Use of natural gas or LPG if natural gas is not available.</td></tr>
<tr><td>CO</td><td>400 ppmvd at 3% O_2, Burner technology controlling NOx as a priority</td></tr>
</table>

<u>RULE REQUIREMENTS</u>:
Rule 414 - Water Heaters, Boilers And Process Heaters Rated Less Than 1,000,000 BTU Per Hour
For units with a rating of ≥ 75,000 Btu/hr to < 400,000 Btu/hr
Pool/Spa Heater – 55 ppmvd of NOx corrected to 3% O_2
All others – 20 ppmvd of NOx corrected to 3% O_2

For units with a rating of ≥ 400,000 Btu/hr to < 1 MMBtu/hr
20 ppmvd of NOx corrected to 3% O_2
400 ppmvd of CO corrected to 3% O_2

Rule 411 - NOx from Boilers, Process Heaters and Steam Generators
For units with a rating of ≥ 1 MMBtu/hr to < 2 MMBtu/hr
30 ppmvd of NOx corrected to 3% O_2
400 ppmvd of CO corrected to 3% O_2
</td></tr>
</table>

<table>
<tr><td>District/Agency</td><td>Best Available Control Technology (BACT)/Requirements</td></tr>
<tr><td>South Coast AQMD</td><td>

BACT
Source: SCAQMD BACT Guidelines for Non-Major Polluting Facilities
Note: SCAQMD BACT Guidelines do not contain a determination for boilers/heaters 2 MMBtu/hr or less, since these units are not required to obtain a written permit, pursuant to SCAQMD Rule 219.

SCAQMD Rule 219(b)(2)
Written permits are not required for boilers, process heaters, or any combustion equipment that has a rated maximum heat input capacity of 2,000,000 Btu per hour (gross) or less and are equipped to be heated exclusively with natural gas, methanol, liquefied petroleum gas, or any combination thereof.

<table>
<tr><td colspan="2">For units with a rating of 75,000 Btu/hr to < 2 MMBtu/hr</td></tr>
<tr><td>VOC</td><td>N/A – No BACT determinations found in the ≥ 0.075 to <2 MMBtu/hr range</td></tr>
<tr><td>NOx</td><td>N/A – No BACT determinations found in the ≥ 0.075 to <2 MMBtu/hr range</td></tr>
<tr><td>SOx</td><td>N/A – No BACT determinations found in the ≥ 0.075 to <2 MMBtu/hr range</td></tr>
<tr><td>PM10</td><td>N/A – No BACT determinations found in the ≥ 0.075 to <2 MMBtu/hr range</td></tr>
<tr><td>PM2.5</td><td>N/A – No BACT determinations found in the ≥ 0.075 to <2 MMBtu/hr range</td></tr>
<tr><td>CO</td><td>N/A – No BACT determinations found in the ≥ 0.075 to <2 MMBtu/hr range</td></tr>
</table>

RULE REQUIREMENTS:

Reg XI, Rule 1146.2 – Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers and Process Heaters

Category	NOx Limit	CO Limit	Units manufactured for use or offered for sale after
Type 1 Unit (except pool heaters)	14 nanograms per joule of heat output (20 ppmvd @ 3% O_2)	No standard	January 1, 2012
Type 1 Unit (pool heater)	40 nanograms per joule of heat output (55 ppmvd NOx @3% O_2)	No standard	January 1, 2001
Type 2 Unit	14 nanograms per joule of heat output (20 ppmvd @ 3% O_2)	400 ppmvd @ 3% O_2	January 1, 2010

(A) TYPE 1 UNIT means any water heater, boiler or process heater with a RATED HEAT INPUT CAPACITY less than or equal to 400,000 BTU per hour excluding TANK TYPE WATER HEATERS subject to the limits of District Rule 1121.
(B) TYPE 2 UNIT means any water heater, boiler or process heater with a RATED HEAT INPUT CAPACITY greater than 400,000 BTU per hour up to and including 2,000,000 BTU per hour.

</td></tr>
</table>

<table>
<tr><td>District/Agency</td><td>Best Available Control Technology (BACT)/Requirements</td></tr>
<tr><td>San Diego County APCD</td><td>

BACT
Source: NSR Requirements for BACT
Note: SDCAPCD BACT Guidelines do not contain a determination for boilers/heaters 5 MMBtu/hr or less, since these units are not required to obtain a written permit, pursuant to SDAPCD Rule 11.

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.

<table>
<tr><td colspan="2">For units with a rating of 75,000 Btu/hr to < 2 MMBtu/hr</td></tr>
<tr><td>VOC</td><td>N/A – No BACT determinations found in the ≥ 0.075 to <2 MMBtu/hr range</td></tr>
<tr><td>NOx</td><td>N/A – No BACT determinations found in the ≥ 0.075 to <2 MMBtu/hr range</td></tr>
<tr><td>SOx</td><td>N/A – No BACT determinations found in the ≥ 0.075 to <2 MMBtu/hr range</td></tr>
<tr><td>PM10</td><td>N/A – No BACT determinations found in the ≥ 0.075 to <2 MMBtu/hr range</td></tr>
<tr><td>PM2.5</td><td>N/A – No BACT determinations found in the ≥ 0.075 to <2 MMBtu/hr range</td></tr>
<tr><td>CO</td><td>N/A – No BACT determinations found in the ≥ 0.075 to <2 MMBtu/hr range</td></tr>
</table>

RULE REQUIREMENTS:
Regulation 4, Rule 69.2.1 – Small Boilers, Process Heaters, and Steam Generators

<table>
<tr><td colspan="3">Emission Limits (Effective on or after March 25, 2010)</td></tr>
<tr><td rowspan="2">Type of equipment and size, in MMBtu/hr</td><td>NOx</td><td>CO</td></tr>
<tr><td>ppmvd</td><td>ppmvd</td></tr>
<tr><td>Units ≥ 0.6 and ≤ 2.0, except as below, fired on gaseous fuel</td><td>30</td><td>400</td></tr>
<tr><td>Units ≥ 0.6 and ≤ 2.0, except as below, fired on liquid fuel</td><td>40</td><td>400</td></tr>
<tr><td>Units < 0.6</td><td>Rule not applicable</td><td>Rule not applicable</td></tr>
</table>

(A) This rule does not apply to waste heat recovery boilers
(B) This rule does not apply to Furnaces, kilns, and any combustion equipment where the material being heated is in direct contact with the products of combustion.
(C) This rule does not apply to thermal oxidizers and associated waste heat recovery equipment.

</td></tr>
</table>

<table>
<tr><td>District/Agency</td><td>Best Available Control Technology (BACT)/Requirements</td></tr>
<tr><td>Bay Area AQMD</td><td>

BACT
Source: BAAQMD BACT Guideline
Note: BAAQMD BACT Guidelines do not contain a determination for boilers/heaters 10 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.

BAAQMD Rule 2-1-114
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.

<table>
<tr><td colspan="2">For units with a rating of 75,000 Btu/hr to < 2 MMBtu/hr</td></tr>
<tr><td>VOC</td><td>N/A – No BACT determinations found in the ≥ 0.075 to <2 MMBtu/hr range</td></tr>
<tr><td>NOx</td><td>N/A – No BACT determinations found in the ≥ 0.075 to <2 MMBtu/hr range</td></tr>
<tr><td>SOx</td><td>N/A – No BACT determinations found in the ≥ 0.075 to <2 MMBtu/hr range</td></tr>
<tr><td>PM10</td><td>N/A – No BACT determinations found in the ≥ 0.075 to <2 MMBtu/hr range</td></tr>
<tr><td>PM2.5</td><td>N/A – No BACT determinations found in the ≥ 0.075 to <2 MMBtu/hr range</td></tr>
<tr><td>CO</td><td>N/A – No BACT determinations found in the ≥ 0.075 to <2 MMBtu/hr range</td></tr>
</table>

RULE REQUIREMENTS:

BAAQMD Reg 9, Rule 6 – Nitrogen Oxide Emissions from Natural Gas-fired Boilers and Water Heaters

<table>
<tr><td colspan="3">Emission Limits (Effective January 1, 2013)</td></tr>
<tr><td>Type of unit</td><td>Size of Unit in Btu/hr</td><td>NOx Limit in nanograms per joule of heat output (ppmvd @ 3% O2)</td></tr>
<tr><td>Pool/spa heater</td><td>75,001 to 400,000</td><td>No standard</td></tr>
<tr><td>Pool/spa heater</td><td>400,001 to 2,000,000</td><td>14 (20)</td></tr>
<tr><td>Other boilers/heaters</td><td>75,001 to 2,000,000</td><td>14 (20)</td></tr>
</table>

</td></tr>
</table>

<table>
<tr><td>District/Agency</td><td>Best Available Control Technology (BACT)/Requirements</td></tr>
<tr><td>San Joaquin Valley APCD</td><td>

BACT
Source: SJVUAPCD BACT Guideline
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 SJUVAPCD Rule 2020.

SJVUAPCD Rule 2020 §6.0
No Authority to Construct or Permit to Operate shall be required for (§6.1) steam generators, steam superheaters, 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.

<table>
<tr><td colspan="2">For units with a rating of 75,000 Btu/hr to < 2 MMBtu/hr</td></tr>
<tr><td>VOC</td><td>N/A – No BACT determinations found in the ≥ 0.075 to <2 MMBtu/hr range</td></tr>
<tr><td>NOx</td><td>N/A – No BACT determinations found in the ≥ 0.075 to <2 MMBtu/hr range</td></tr>
<tr><td>SOx</td><td>N/A – No BACT determinations found in the ≥ 0.075 to <2 MMBtu/hr range</td></tr>
<tr><td>PM10</td><td>N/A – No BACT determinations found in the ≥ 0.075 to <2 MMBtu/hr range</td></tr>
<tr><td>PM2.5</td><td>N/A – No BACT determinations found in the ≥ 0.075 to <2 MMBtu/hr range</td></tr>
<tr><td>CO</td><td>N/A – No BACT determinations found in the ≥ 0.075 to <2 MMBtu/hr range</td></tr>
</table>

RULE REQUIREMENTS:
SJVUAPCD Rule 4308 – Boilers, Steam Generators, and Process Heaters – 0.075 MMBtu/hr to less than 2.0 MMBtu/hr

<table>
<tr><td colspan="3">Emission Limits (Effective on or after January 1, 2015)</td></tr>
<tr><td rowspan="2">Type and Size of Unit, in MMBtu/hr</td><td colspan="2">NOx Limit (corrected to 3% O2)</td></tr>
<tr><td>PUC Gas</td><td>Non-PUC Gas or Liquid</td></tr>
<tr><td></td><td>lb/MMBtu of heat input (ppmvd)</td><td>lb/MMBtu of heat input (ppmvd)</td></tr>
<tr><td>Units ≥ 0.075 and ≤ 0.4, except as below</td><td>0.024 (20)</td><td>0.093 (77)</td></tr>
<tr><td>Units > 0.4 and < 2.0, except as below</td><td>0.024 (20)</td><td>0.036 (30)</td></tr>
<tr><td>Instantaneous water heaters ≥ 0.075 and ≤ 0.4</td><td>0.024 (20)</td><td>0.093 (77)</td></tr>
<tr><td>Instantaneous water heaters >0.4 and <2.0</td><td>0.024 (20)</td><td>0.036 (30)</td></tr>
<tr><td>Pool heaters ≥ 0.075 and ≤ 0.4</td><td>0.068 (55)</td><td>0.093 (77)</td></tr>
<tr><td>Pool heaters > 0.4 and < 2.0</td><td>0.024 (20)</td><td>0.036 (30)</td></tr>
</table>

For units with a rating of ≥ 0.4 MMBtu/hr and < 2.0 MMBtu/hr: 400 ppmvd of CO corrected to 3% O_2

</td></tr>
</table>

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

SUMMARY OF ACHIEVED IN PRACTICE CONTROL TECHNOLOGIES	
VOC	1. Good combustion practices [SMAQMD (BACT)] 2. No standard [SCAQMD, SJVUAPCD, SDCAPCD, BAAQMD]
NOx	1. Pool/spa heaters < 400,000 Btu/hr: 55 ppmvd at 3% O_2 All other boilers/heaters: 20 ppmvd at 3% O_2 - [SMAQMD, SCAQMD, SJVUAPCD] 2. Pool/spa heaters < 400,000 Btu/hr: no standard All other boilers/heaters: 20 ppmvd at 3% O_2 - [BAAQMD] 3. Boilers/heaters < 600,000 Btu/hr: no standard All other boilers/heaters: 20 ppmvd at 3% O_2 – [SDCAPCD]
SOx	1. Good combustion practices [SMAQMD (BACT)] 2. No standard [SCAQMD, SJVUAPCD, SDCAPCD, BAAQMD]
PM10	1. Good combustion practices [SMAQMD (BACT)] 2. No standard [SCAQMD, SJVUAPCD, SDCAPCD, BAAQMD]
PM2.5	1. Good combustion practices [SMAQMD (BACT)] 2. No standard [SCAQMD, SJVUAPCD, SDCAPCD, BAAQMD]
CO	1.400 ppmvd at 3% - [SMAQMD (BACT)] 2.Boilers/heaters < 400,000 Btu/hr: no standard All other boilers/heaters: 400 ppmvd at 3% O_2 – [SCAQMD, SJVUAPCD] 3.Boilers/heaters < 600,000 Btu/hr: no standard All other boilers/heaters: 400 ppmvd at 3% O_2 – [SDCAPCD] 4.No standard – [BAAQMD]

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

BEST CONTROL TECHNOLOGIES ACHIEVED		
Pollutant	**Standard**	**Source**
VOC	Good combustion practices	SMAQMD (current BACT)
NOx	Pool/spa heaters < 400,000 Btu/hr: 55 ppmvd at 3% O_2 All other boilers/heaters: 20 ppmvd at 3% O_2	SMAQMD (Rule 414), SDCAPCD (Rule 4308), SCAQMD (Rule 1146.2)
SOx	Good combustion practices	SMAQMD (current BACT)
PM10	Good combustion practices	SMAQMD (current BACT)
PM2.5	Good combustion practices	SMAQMD (current BACT)
CO	400 ppmvd at 3% O_2	SMAQMD (current BACT)

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

Technologically Feasible Alternatives:

Any alternative basic equipment, fuel, process, emission control device or technique, singly or in combination, determined to be technologically feasible by the Air Pollution Control Officer.

The table below shows the technologically feasible alternatives identified as capable of reducing emissions beyond the levels determined to be “Achieved in Practice” as per Rule 202, §205.1.a.

VOC	No other technologically feasible option identified
NOx	1. Selective Catalytic Reduction (SCR) 2. Flue Gas Recirculation (FGR) with a Low-NOx burner
SOx	No other technologically feasible option identified
PM10	No other technologically feasible option identified
PM2.5	No other technologically feasible option identified
CO	No other technologically feasible option identified

Cost Effective Determination

After identifying the technologically feasible control options, a cost analysis is performed to take into consideration economic impacts for all technologically feasible controls identified.

Maximum Cost per Ton of Air Pollutants Controlled

A control technology is considered to be cost-effective if the cost of controlling one ton of that air pollutant is less than the limits specified below (except coating operations):

Pollutant	Maximum Cost ($/ton)
ROG	17,500
NO_X	24,500
PM_{10}	11,400
SO_X	18,300
CO	TBD if BACT triggered

SCR:

Typically selective catalytic reduction (SCR) can be used to reduce emissions from larger boilers. SCR requires ammonia or urea for NOx reduction and units of this size range are typically used in residences and service/commercial applications where storage of these materials is impractical and could pose a health risk. Additionally, SCR is designed for industrial units that run full time and can maintain a temperature that the catalyst requires for NOx reduction, whereas smaller units are turned on and off throughout the day and cannot maintain the required temperatures. Finally, SCR systems require frequent maintenance for operation which may not be practical in a residential or small service/commercial setting.

District Staff has done an analysis[1] for using SCR on a boiler rated at 20 MMBTU/hr and the cost effectiveness was $53,084 per ton of NOx reduced. As the rating of the unit goes down the total emission reduction will decrease while cost will stay relatively equivalent and therefore the cost effectiveness will increase. Therefore, SCR is not only technologically infeasible for this size range of boilers/heaters but it is also not cost effective and is eliminated as a control option.

FGR with a Low-NOx Burner:

Adding FGR to a smaller unit would result in minimal additional reductions when paired with a low-NOx burner, and would cost more than a low-NOx burner alone. Like SCR, the system requires frequent maintenance for operation which may not be practical in a residential or small service/commercial setting. The BAAQMD did an analysis of adding FGR to a boiler in the 400,000 to 2,000,000 Btu/hr range in their 2007 Staff Report for Regulation 9, Rule 6 and found that the

[1] SMAQMD, "BACT Determination: Boilers/Heaters ≥5 and <20 MMBTU/hr fired on natural gas or LPG," June 3,2015

incremental cost effectiveness of adding FGR over a low-NOx burner is estimated at $60,000 per ton of NOx reduced. Therefore, FGR added to a boiler/heater with a low-NOx burner is not cost effective and is eliminated as a control option.

C. SELECTION OF BACT:

Because no other technically feasible alternatives are available for the size range of these boilers/heaters BACT for VOC, SOx, PM10, PM2.5 and CO will remain at what is currently achieved in practice. Currently what is in SMAQMD Rule 412 and other district rules are more stringent than the current BACT standard by limiting the size range of pool/spa heaters that can fall under the 55 ppmvd emission limit.

BACT for Boilers/Heaters ≥ 75,000 Btu/hr and < 2.0 MMBtu/hr Fired on Natural Gas		
Pollutant	**Standard**	**Source**
VOC	Good combustion practices	SMAQMD (current BACT)
NOx	Pool/spa heaters < 400,000 Btu/hr: 55 ppmvd at 3% O_2 All other boilers/heaters: 20 ppmvd at 3% O_2	SMAQMD (Rule 414), SDCAPCD (Rule 4308), SCAQMD (Rule 1146.2)
SOx	Good combustion practices	SMAQMD (current BACT)
PM10	Good combustion practices	SMAQMD (current BACT)
PM2.5	Good combustion practices	SMAQMD (current BACT)
CO	400 ppmvd at 3% O_2	SMAQMD (current BACT)

D. SELECTION OF T-BACT:

Toxics are in the form of VOCs and particulate matter. Since toxic emission from natural gas fired boilers in the 2 MMBtu/hr or less size range are so small and the cancer risk is not expected to be anywhere close to 1 in a million cases, T-BACT was not evaluated for this determination.

REVIEWED BY: _____ **DATE:** _____

APPROVED BY: _____ **DATE:** _____