San Joaquin Valley
Unified Air Pollution Control District

Best Available Control Technology (BACT) Guideline 1.1.1*

Last Update: 11/30/2022

Natural gas or propane fired boilers/steam generators** with heat input rate greater than 5 MMBtu/hr and less than or equal to 20 MMBtu/hr

Pollutant	Achieved in Practice or contained in the SIP	Technologically Feasible	Alternate Basic Equipment
VOC	PUC quality natural gas or propane with LPG backup		
SOx	PUC quality natural gas or propane with LPG backup		
PM10	PUC quality natural gas or propane with LPG backup		
NOx	5 ppmvd @ 3% O2 (0.0061 lb/MMBtu)		
CO	50 ppmvd @ 3% O2 (0.037 lb/MMBtu)		

* This is a Summary Page for this Class of Source.
** This guideline is applicable to units fired solely on natural gas from a PUC or FERC regulated source or propane/LPG. This guideline is not applicable to Oilfield Steam Generators or Electric Utility Steam Generating Units.

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

***This is a Summary Page for this Class of Source**

San Joaquin Valley
Unified Air Pollution Control District

Best Available Control Technology (BACT) Guideline 1.1.2*

Last Update: 11/30/2022

Natural gas or propane fired boilers/steam generators** with heat input rate greater than 20 MMBtu/hr

Pollutant	Achieved in Practice or contained in the SIP	Technologically Feasible	Alternate Basic Equipment
VOC	PUC quality natural gas or propane with LPG backup		
SOx	PUC quality natural gas or propane with LPG backup		
PM10	PUC quality natural gas or propane with LPG backup		
NOx	2.5 ppmvd @ 3% O2 (0.003 lb/MMBtu)		
CO	50 ppmvd @ 3% O2 (0.037 lb/MMBtu)		

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** This guideline is applicable to units fired solely on natural gas from a PUC or FERC regulated source or propane/LPG. This guideline is not applicable to Oilfield Steam Generators or Electric Utility Steam Generating Units.

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San Joaquin Valley
Unified Air Pollution Control District

Best Available Control Technology (BACT) Guideline 1.4.3*

Last Update: 1/12/2021

Landfill Gas Vapor Collection System

Pollutant	Achieved in Practice or contained in the SIP	Technologically Feasible	Alternate Basic Equipment
VOC	Use of an enclosed ultra-low NOx flare with a control efficiency of ≥ 98% or a controlled VOC emissions concentration of ≤ 20 ppmvd @ 3% O2 (as hexane, equivalent to 0.038 lb-VOC/MMBtu) and a NOx emissions rate of ≤ 0.025 lb-NOx/MMBtu		

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San Joaquin Valley
Unified Air Pollution Control District

Best Available Control Technology (BACT) Guideline 1.4.9*

Last Update: 11/18/2024

Dairy Digester Gas Backup Limited Use Flare**

Pollutant	Achieved in Practice or contained in the SIP	Technologically Feasible	Alternate Basic Equipment
VOC	0.006 lb/MMBtu		No flare – Excess gas is recycled or not combusted
SOx	Sulfur content of digester gas flared =< 40 ppmv as H2S		No flare – Excess gas is recycled or not combusted
PM10	Sulfur content of digester gas flared =< 40 ppmv as H2S		No flare – Excess gas is recycled or not combusted
NOx	0.06 lb/MMBtu	0.025 lb/MMBtu***	No flare – Excess gas is recycled or not combusted

** To use this guideline, the amount of flaring must not be more than 26,000 MMBtu/yr on a heat input basis and not more than 876 of total hours of flaring per year. If either of these limits is exceeded, the flare is not backup limited use and falls outside the scope of this guideline.

*** If a NOx standard of 0.025 lb/MMBtu is proposed or found to be cost effective, the VOC BACT standard becomes 0.038 lb/MMBtu under this guideline.

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San Joaquin Valley
Unified Air Pollution Control District

Best Available Control Technology (BACT) Guideline 1.4.10*

Last Update: 11/18/2024

Dairy Digester Gas Flare

Pollutant	Achieved in Practice or contained in the SIP	Technologically Feasible	Alternate Basic Equipment
VOC	0.038 lb/MMBtu		No flare – Excess gas is recycled or not combusted
SOx	Sulfur content of digester gas flared =< 40 ppmv as H2S		No flare – Excess gas is recycled or not combusted
PM10	Sulfur content of digester gas flared =< 40 ppmv as H2S		No flare – Excess gas is recycled or not combusted
NOx	0.025 lb/MMBtu		No flare – Excess gas is recycled or not combusted

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San Joaquin Valley
Unified Air Pollution Control District

Best Available Control Technology (BACT) Guideline 1.5.10*

Last Update: 10/9/2018

Container Glass Annealing Lehr

Pollutant	Achieved in Practice or contained in the SIP	Technologically Feasible	Alternate Basic Equipment
VOC	Utilize PUC quality natural gas fuel with LPG as backup fuel		Electric Annealing Lehr
SOx	Utilize PUC quality natural gas fuel with LPG as backup fuel		Electric Annealing Lehr
PM10	Utilize PUC quality natural gas fuel with LPG as backup fuel		Electric Annealing Lehr
NOx	Utilize burner system with 60 ppmvd NOx @ 3% O2 or 0.073 lb-NOx/MMBtu fired on PUC quality natural gas, and LPG as backup fuel		Electric Annealing Lehr
CO	Utilize burner system with 20 ppmv CO @ 3% O2 or 0.015 lb-CO/MMBtu fired on PUC quality natural gas, and LPG as backup fuel		Electric Annealing Lehr

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San Joaquin Valley
Unified Air Pollution Control District

Best Available Control Technology (BACT) Guideline 1.5.11*

Last Update: 5/21/2020

Container Glass Production - Mold Swabbing Operation

Pollutant	Achieved in Practice or contained in the SIP	Technologically Feasible	Alternate Basic Equipment
PM10	Using best management practices and the judicial use of mold swabbing material (< or = 0.211 lb of material per ton of glass produced) with PM10 emissions of 0.19 lb/ton of glass formed		

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San Joaquin Valley
Unified Air Pollution Control District

Best Available Control Technology (BACT) Guideline 1.5.12*

Last Update: 7/7/2020

Secondary Aluminum Melting: Sweat Furnace, Holding Furnace and Reverb Furnace

Pollutant	Achieved in Practice or contained in the SIP	Technologically Feasible	Alternate Basic Equipment
VOC	Sweat Furnaces: Afterburner (>=0.3 sec retention time at >=1,400°F) or secondary combustion chamber Holding and Reverb Furnaces (non-sweating): None		
SOx	Use natural gas fuel		
PM10	Sweat Furnaces: Use of natural gas fuel, afterburner with 1,400°F chamber temperature, and a baghouse with fabric filters Holding and Reverb Furnaces (non-sweating): Use of natural gas fuel and a baghouse with fabric filters		
NOx	Sweat Furnaces: 50 ppmvd @ 3% O2 (Use of Low-NOx Burners) Holding Furnaces: 40 ppmvd @ 3% O2 (Use of Low-NOx Burners) Reverb Furnaces (non-sweating): 53 ppmvd @ 3% O2 (Use of Low-NOx Burners)	Sweat, Holding, and Reverb Furnaces: 1) 6.0 ppmvd @ 3% O2 (Use of Low-NOx Burners and Selective Catalytic Reduction) 2) 12.0 ppmvd @ 3% O2 (Use of Low-NOx Burners and Regenerative Selective Catalytic Reduction) 3) 30 ppmvd @ 3% O2 (Use of Low-NOx Burners and Selective Non-Catalytic Reduction)	Use of Electric Furnaces
CO	Use natural gas fuel	1) 5 ppmvd @ 3% O2, Oxidation catalyst or equivalent control; 2) 50 ppmvd @ 3% O2	Use of Electric Furnaces

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San Joaquin Valley
Unified Air Pollution Control District

Best Available Control Technology (BACT) Guideline 1.6.1*

Last Update: 4/14/2020

Vegetable Dry Roasting Operation

Pollutant	Achieved in Practice or contained in the SIP	Technologically Feasible	Alternate Basic Equipment
NOx	60 ppmv @ 3% O2 (equivalent to 6.5 ppmv @ 19% O2 or 0.073 lb-NOx/MMBtu)	9 ppmv @ 3% O2 (equivalent to 1.0 ppmv @ 19% O2 or 0.011 lb-NOx /MMBtu) or less with Selective Catalytic Reduction	

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***This is a Summary Page for this Class of Source**

San Joaquin Valley
Unified Air Pollution Control District

Best Available Control Technology (BACT) Guideline 1.6.3*

Last Update: 2/21/2020

Snack Chip Fryer with Indirect-Fired Heat Transfer System

Pollutant	Achieved in Practice or contained in the SIP	Technologically Feasible	Alternate Basic Equipment
VOC	COMBUSTION EMISSIONS: Use PUC quality natural gas fuel with LPG/Propane as backup fuel FRYING PROCESS EMISSIONS: None	FRYING PROCESS EMISSIONS: 1) 85% control (combined VOC and PM control by thermal oxidizer, or equal); 2) 80% control (combined VOC and PM control by carbon adsorber, or equal)	
SOx	Use PUC quality natural gas fuel with LPG/Propane as backup fuel		
PM10	COMBUSTION EMISSIONS: Use PUC quality natural gas fuel with LPG/Propane as backup fuel FRYING PROCESS EMISSIONS: 75% control (oil mist eliminator or equal)	FRYING PROCESS EMISSIONS: 1) 85% control (combined VOC and PM control by thermal oxidizer, or equal); 2) 80% control (combined VOC and PM control by carbon adsorber, or equal)	
NOx	9 ppmvd @ 3% O2 for units greater than 5 MMBtu/hr to less than or equal to 20 MMBtu/hr 7 ppmvd @ 3% O2 for units greater than 20 MMBtu/hr		
CO	100 ppmvd @ 3% O2		

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San Joaquin Valley
Unified Air Pollution Control District

Best Available Control Technology (BACT) Guideline 1.6.4*

Last Update: 6/21/2023

Snack Chip Oven

Pollutant	Achieved in Practice or contained in the SIP	Technologically Feasible	Alternate Basic Equipment
VOC	Use of PUC quality natural gas		
SOx	Use of PUC quality natural gas		
PM10	Use of PUC quality natural gas		
NOx	30 ppmvd @ 3% O2 (0.036 lb/MMBtu) with use of low-NOx burner system and using natural gas as primary fuel, or equivalent controls	Low temperature selective catalytic reduction (SCR) to achieve 2.5 ppmvd NOx @ 3% O2 (0.003 lb/MMBtu) and use of PUC quality natural gas fuel, or equivalent controls	
CO	400 ppmvd @ 3% O2 and use of PUC quality natural gas		

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San Joaquin Valley
Unified Air Pollution Control District

Best Available Control Technology (BACT) Guideline 1.6.8*

Last Update: 11/1/2022

Pistachio Nut Column Dryer (including Silo Heaters and Sample Dryers rated < 5 MMBtu/hr)

Pollutant	Achieved in Practice or contained in the SIP	Technologically Feasible	Alternate Basic Equipment
VOC	1) Natural gas, or 2) LPG for operations with no access to a natural gas fuel source		
SOx	1) PUC-quality natural gas, or 2) LPG for operations with no access to a PUC-quality natural gas fuel source		
PM10	1) Natural gas, or 2) LPG for operations with no access to a natural gas fuel source		
NOx	1) Low NOx burner and natural gas @ 0.0832 lb-NOx/MMBtu, or 2) Low NOx burner and LPG @ 0.1248 lb-NOx/MMBtu for operations with no access to a natural gas fuel source	Low NOx burner and natural gas @ 0.024 lb-NOx/MMBtu	

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San Joaquin Valley
Unified Air Pollution Control District

Best Available Control Technology (BACT) Guideline 1.6.11*

Last Update: 5/9/2019

Direct-Fired Dairy Products Spray Dryer

Pollutant	Achieved in Practice or contained in the SIP	Technologically Feasible	Alternate Basic Equipment
VOC	Use of PUC quality natural gas fuel with LPG as backup fuel		
SOx	Use of PUC quality natural gas fuel with LPG as backup fuel		
PM10	Use of a baghouse/dust collector and PUC quality natural gas fuel with LPG as backup fuel		
NOx	Use of a 2.2 ppmv NOx @ 19% O2 (equivalent to 20 ppmv NOx @ 3% O2 or 0.0243 lb-NOx/MMBtu) low NOx burner (or equivalent) fired on PUC quality natural gas with LPG as backup fuel	Use of a 1.0 ppmv NOx @ 19% O2 (equivalent to 9 ppmv NOx @ 3% O2 or 0.0109 lb-NOx/MMBtu) ultra low NOx burner (or equivalent) fired on PUC quality natural gas with LPG as backup fuel	
CO	Use of a 42 ppmv CO @ 19% O2 (equivalent to 387 ppmv CO @ 3% O2 or 0.286 lb-CO/MMBtu) burner (or lower) fired on PUC quality natural gas with LPG as backup fuel		

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San Joaquin Valley
Unified Air Pollution Control District

Best Available Control Technology (BACT) Guideline 1.6.13*

Last Update: 6/29/2026

Dehydrator – Fruit and Vegetable (excluding onions), Continuous Belt

Pollutant	Achieved in Practice or contained in the SIP	Technologically Feasible	Alternate Basic Equipment
VOC	PUC quality natural gas fuel		
PM10	PUC quality natural gas fuel	1. Baghouse (for material handling) 2. Cyclone (for material handling)	
NOx	Burner(s) with NOx emissions ≤ 0.036 lb-NOx/MMBtu	Burner(s) with NOx emissions ≤ 0.011 lb-NOx/MMBtu	Electric heater

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San Joaquin Valley
Unified Air Pollution Control District

Best Available Control Technology (BACT) Guideline 1.6.22*

Last Update: 7/1/2020

Wood Drying Kiln

Pollutant	Achieved in Practice or contained in the SIP	Technologically Feasible	Alternate Basic Equipment
VOC	Natural gas (good operating practice and maintenance)	1) 98% or greater capture and control (thermal oxidizer, catalytic oxidizer or equivalent) 2) 95% or greater capture and control (carbon adsorption, provided the contaminated air stream does not contain any ingredient that could combust as a result of adsorption to carbon or equivalent)	
SOx	Natural gas (good operating practice and maintenance)		
PM10	Natural gas (good operating practice and maintenance)		
NOx	Natural gas (good operating practice and maintenance)	1) =< 10 ppmvd @ 3% O2 (equivalent to 0.012 lb/MMBtu or less) 2) =< 15 ppmvd @ 3% O2 (equivalent to 0.018 lb/MMBtu or less)	
CO	Natural gas (good operating practice and maintenance)	=< 25 ppmvd @ 3% O2	

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San Joaquin Valley
Unified Air Pollution Control District

Best Available Control Technology (BACT) Guideline 1.6.24*

Last Update: 12/30/2020

Commercial Bakery Oven

Pollutant	Achieved in Practice or contained in the SIP	Technologically Feasible	Alternate Basic Equipment
VOC	Overall 98% capture and control efficiency with the use of thermal/catalytic incineration (or equivalent) with NOx emissions ≤ 60 ppmvd @ 3% O2 (0.073 lb-NOx/MMBtu) for thermal/catalytic incinerator units rated equal to or greater than 0.325 MMBtu/hr, and CO emissions of 800 ppmvd @ 3% O2 (or less) for thermal/catalytic incinerator units		
SOx	Use PUC quality natural gas fuel		
PM10	Use PUC quality natural gas fuel		
NOx	30 ppmvd @ 3% O2 equivalent to 0.036 lb/MMBtu and use of PUC quality natural gas fuel	Use of low Temperature – Selective Catalytic Reduction	Electric Oven
CO	800 ppmvd @ 3% O2 and use of PUC quality natural gas fuel		

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San Joaquin Valley
Unified Air Pollution Control District

Best Available Control Technology (BACT) Guideline 1.6.25*

Last Update: 12/29/2021

Blood Drying Operation

Pollutant	Achieved in Practice or contained in the SIP	Technologically Feasible	Alternate Basic Equipment
VOC	95% Overall Capture and Control Efficiency (Incineration at 1,600 °F for not less than 0.5 seconds, or equal)		
PM10	0.579 lb-PM10/ton of dried blood		
NH3	0.6 lb-NH3/ton of dried blood (Venturi Scrubber vented to Packed Bed Scrubber, thermal oxidizer, or equal)	Wet scrubber for NH3 removal prior to thermal oxidizer (only if thermal oxidizer is used and the oxidation of NH3 results in more than 2.0 lb/day of NOx	
H2S		Wet scrubber for H2S removal prior to thermal oxidizer (only if thermal oxidizer is used and the oxidation of H2S results in more than 2.0 lb/day of SOx emissions)	

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San Joaquin Valley
Unified Air Pollution Control District

Best Available Control Technology (BACT) Guideline 1.6.30*

Last Update: 3/24/2022

Heat-Sterilizing Kiln for Wood, Gaseous Fuel Fired

Pollutant	Achieved in Practice or contained in the SIP	Technologically Feasible	Alternate Basic Equipment
VOC	Use of natural gas-fired kiln, or LPG-fired kiln (for operations with no access to a natural gas fuel source)		
SOx	Use of natural gas-fired kiln, or LPG-fired kiln (for operations with no access to a natural gas fuel source)		
PM10	Use of natural gas-fired kiln, or LPG-fired kiln (for operations with no access to a natural gas fuel source)		
NOx	Use of natural gas-fired kiln, or LPG-fired kiln (for operations with no access to a natural gas fuel source)	1) Ultra-low NOx burner rated at =< 10 ppmvd @ 3% O2 using natural gas or LPG 2) Low NOx burner rated at =< 30 ppmvd @ 3% O2 using natural gas, or =< 40 ppmvd @ 3% O2 using LPG (for operations with no access to a natural gas fuel source)	
CO	Use of natural gas-fired kiln, or LPG-fired kiln (for operations with no access to a natural gas fuel source)	Burner rated at =< 25 ppmvd @ 3% O2	

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San Joaquin Valley
Unified Air Pollution Control District

Best Available Control Technology (BACT) Guideline 1.6.31*

Last Update: 5/14/2024

Chain-driven Charbroiler

Pollutant	Achieved in Practice or contained in the SIP	Technologically Feasible	Alternate Basic Equipment
VOC	Catalytic Oxidizer (86% control for VOC)		
PM10	Catalytic Oxidizer (83% control for PM10)		

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San Joaquin Valley
Unified Air Pollution Control District

Best Available Control Technology (BACT) Guideline 1.8.5*

Last Update: 3/29/2023

Process heaters** with heat input rate =< 20 MMBtu/hr

Pollutant	Achieved in Practice or contained in the SIP	Technologically Feasible	Alternate Basic Equipment
VOC	PUC quality natural gas or propane with LPG backup		
SOx	PUC quality natural gas or propane with LPG backup		
PM10	PUC quality natural gas or propane with LPG backup		
NOx	9 ppmvd @ 3% O2 (0.011 lb/MMBtu)	5 ppmvd @ 3% O2 (0.0061 lb/MMBtu)	
CO	50 ppmvd @ 3% O2 (0.037 lb/MMBtu)		

**This guideline is applicable to units fired solely on natural gas from a PUC regulated source or propane/LPG. This guideline is not applicable to Refinery Units, Oilfield Steam Generators, or Electric Utility Steam Generating Units.

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San Joaquin Valley
Unified Air Pollution Control District

Best Available Control Technology (BACT) Guideline 1.8.6*

Last Update: 3/1/2024

Natural Gas-Fired Process Heater (> 20 MMBtu/hr)

Pollutant	Achieved in Practice or contained in the SIP	Technologically Feasible	Alternate Basic Equipment
SOx	Use of PUC-Quality Natural Gas		
PM10	Use of PUC-Quality Natural Gas		
NOx	5 ppmvd @ 3% O2	2.5 ppmvd @ 3% O2	

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San Joaquin Valley
Unified Air Pollution Control District

Best Available Control Technology (BACT) Guideline 1.8.7*

Last Update: 3/1/2024

Hydrogen Production - Steam Hydrocarbon Reformer: Process Heater

Pollutant	Achieved in Practice or contained in the SIP	Technologically Feasible	Alternate Basic Equipment
SOx	Process heater firing on a fuel meeting the District Rule 4320 fuel sulfur requirement of 5 grains S/100 dscf		1) Hydrogen production via electrolysis 2) Hydrogen production via partial oxidation process**, autothermal reforming or gasification
PM10	Process heater meeting a limit of 0.0039 lb/MMBtu		1) Hydrogen production via electrolysis 2) Hydrogen production via partial oxidation process**, autothermal reforming or gasification
NOx	Process heater meeting a limit of 2.7 ppmv @ 3% O2	Process Heater meeting 2.5 ppmv @ 3% O2	1) Hydrogen production via electrolysis 2) Hydrogen production via partial oxidation process**, autothermal reforming or gasification

** Partial oxidation includes the Grannus Process™ (2023)

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San Joaquin Valley
Unified Air Pollution Control District

Best Available Control Technology (BACT) Guideline 1.9.3*

Last Update: 6/9/2022

Crematory (Funeral Service and Crematories, Animal Crematory) - Gaseous Fuel Fired

Pollutant	Achieved in Practice or contained in the SIP	Technologically Feasible	Alternate Basic Equipment
VOC	Natural Gas/LPG fuel and a secondary combustion chamber (afterburner) > 1,600 º F		
SOx	Natural Gas/LPG fuel	Natural Gas/LPG fuel with a Dry Scrubber and a Baghouse	
PM10	Natural Gas/LPG fuel and a secondary combustion chamber (afterburner) > 1,600 º F	Natural Gas/LPG fuel with a Baghouse	
NOx	Natural Gas/LPG fuel and 60 ppmv @ 3% O2 (0.073 lb/MMBtu) without charge		

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San Joaquin Valley
Unified Air Pollution Control District

Best Available Control Technology (BACT) Guideline 1.9.11*

Last Update: 7/1/2020

Commercial Laundry Dryer, Natural Gas-Fired - < 5.0 MMBtu/hr

Pollutant	Achieved in Practice or contained in the SIP	Technologically Feasible	Alternate Basic Equipment
VOC	Use of PUC quality natural gas fuel		
SOx	Use of PUC quality natural gas fuel		
PM10	Use of a lint collector with a control efficiency of >= 75% or equivalent and PUC quality natural gas fuel	1) Use of a baghouse with a control efficiency of >= 99% or equivalent and PUC quality natural gas fuel 2) Use of a venturi scrubber with a control efficiency of >= 90% or equivalent and PUC quality natural gas fuel	
NOx	Use of 30 ppmvd NOx @ 3% O2 (equivalent to 0.0365 lb-NOx/MMBtu) low NOx burner (or equivalent) fired on PUC quality natural gas fuel	Use of 9.2 ppmvd @ 3% O2 (equivalent to 0.0111 lb-NOx/MMBtu) ultra-low NOx burner (or equivalent) fired on PUC quality natural gas fuel	
CO	Use of 114 ppmvd CO @ 3% O2 (equivalent to 0.084 lb-CO/MMBtu) burner (or lower) fired on PUC quality natural gas fuel	Use of 4.6 ppmvd CO @ 3% O2 (equivalent to 0.0034 lb-CO/MMBtu) burner fired on PUC quality natural gas fuel	

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

***This is a Summary Page for this Class of Source**