Environment

Submitted for:
Virginia Electric and Power Company
Warren County, Virginia

Submitted by:
AECOM
Raleigh, North Carolina
60136907
Mitsubishi-
Revision 2 - April 2010

Air Permit Application – Volume II

Warren County Combined-Cycle Project
Warren County, Virginia

Environment

Submitted for:
Virginia Electric and Power Company
Warren County, Virginia

Submitted by:
AECOM
Raleigh, North Carolina
60136907
Mitsubishi-
Revision 2 - April 2010

Air Permit Application – Volume II

Warren County Combined-Cycle Project
Warren County, Virginia

Prepared By Joshua Ralph

Reviewed By Thomas Pritcher

Contents

1.0 Introduction 1-1

1.1 Applicant Information 1-2
1.1.1 Applicant's Contacts 1-2

1.2 Project Location 1-2
1.2.1 Surrounding Property 1-2

1.3 Facility Classification 1-4
1.3.1 Standard Industrial Classification Code 1-4
1.3.2 Air Quality Source Designation 1-4

1.4 Document Organization 1-5

2.0 Process Description 2-1

2.1 Major Facility Components 2-1
2.1.1 Gas Turbines 2-1
2.1.2 Heat Recovery Steam Generators 2-2
2.1.3 Steam Turbine 2-2
2.1.4 Turbine Inlet Chillers 2-2
2.1.5 Auxiliary Boiler 2-3
2.1.6 Fuel Gas Heater 2-3
2.1.7 Fuel Gas System 2-3
2.1.8 Diesel Fired Emergency Generator 2-3
2.1.9 Diesel Fired Fire Water Pump 2-3

3.0 Criteria and PSD Pollutant Emission Summary 3-1

3.1 Combustion Turbines 3-1
3.1.1 Normal Operations 3-1
3.1.2 Start-up/Shutdown Operations 3-2
3.1.3 Combustion Turbine Emissions: Annual 3-5

3.2 Ancillary Equipment 3-6
3.2.1 Auxiliary Boiler 3-7
3.2.2 Fuel Gas Heater 3-7
3.2.3 Turbine Chillers 3-7
3.2.4 Emergency Engines 3-7

3.3 Project Emissions 3-8

4.0 Applicable Requirements and Standards 4-1

4.1 Classification with Regard to Ambient Air Quality 4-1

4.2 PSD Program 4-3

4.2.1 PSD Applicability 4-3
4.2.2 PSD Program Requirements 4-5
4.3 Good Engineering Stack Height Analysis 4-9
4.4 Applicability of New Source Performance Standards (NSPS) 4-10
4.4.1 Subpart A – General Provisions 4-10
4.4.2 Subpart Dc – Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units 4-11
4.4.3 Subpart IIII – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines 4-11
4.4.4 Subpart KKKK – Standards of Performance for Stationary Combustion Turbine Emissions 4-11
4.5 40 CFR 61 NESHAPs 4-12
4.6 40 CFR 63 NESHAPs 4-13
4.7 Title IV Acid Rain Provisions 4-13
4.8 Risk Management Program, Section 112(r) 4-14
4.9 Applicability of Title V – Major Source Operating Permit 4-14
4.9.1 Clean Air Interstate Rule (CAIR) 4-14
4.10 State Regulatory Review 4-15

5.0 Control Technology Review 5-1

5.1 Technical Approach 5-1
5.1.1 Top-Down BACT Analysis 5-1
5.1.2 State Control Technology Analysis 5-2
5.1.3 Previous BACT Determinations 5-3
5.2 Combined Cycle Gas Turbine 5-3
5.2.1 BACT for Nitrogen Oxides 5-3
5.2.2 BACT for Carbon Monoxide (CO) 5-6
5.2.3 BACT for Volatile Organic Compounds 5-7
5.2.4 BACT for Particulate Matter (PM), Particulate Matter Less than 10 Microns (PM_{10}) and Particulate Matter Less than 2.5 Microns ($PM_{2.5}$) 5-8
5.2.5 BACT for SO_2 and Sulfuric Acid Mist 5-10
5.2.6 Ammonia and Other Combustion Turbine Emissions 5-10
5.2.7 Combustion Turbine BACT Summary for Continuous Operations 5-10
5.2.8 BACT for Combustion Turbine Startup and Shutdown Emissions 5-11
5.3 Auxiliary Boiler and Fuel Gas Heater BACT 5-14
5.3.1 BACT for Carbon Monoxide (CO) and Volatile Organic Compounds (VOCs) 5-17
5.3.2 BACT for Particulate Matter (PM), Particulate Matter, Particulate Matter Less than 10 Microns (PM_{10}) and Particulate Matter Less than 2.5 Microns ($PM_{2.5}$) 5-20
5.3.3 BACT for SO_2 and Sulfuric Acid Mist 5-20

5.3.4 Other Auxiliary Boiler and Fuel Gas Heater Emissions 5-20
5.3.5 Auxiliary Boiler and Fuel Gas Heater BACT Summary 5-20
5.4 Cooling Tower BACT 5-21
5.5 Emergency Generator and Fire-Water Pump BACT 5-21

6.0 PSD Class II Modeling Procedures – Significant Impact Level Analysis 6-1

7.0 Class II Area Significant Impact Level (SIL) Analysis 7-1

8.0 Class I Area Modeling Analysis 8-1

9.0 Other Air Quality Issues 9-1

10.0 $PM_{2.5}$ Modeling Analysis 10-1

11.0 References 11-1

List of Appendices

Appendix A Application Forms

Appendix B Vendor Information and Emission Calculations

Appendix C Control Technology Review

Appendix D Plot Plan

Appendix E Site-Specific Adjustment to Land Use for AERSURFACE Modeling

Appendix F Air Dispersion Modeling Files

Appendix G Background Emission Inventory

List of Tables

Table 3-1 Maximum Hourly and Annual [(a)] Emissions during Normal Operations 3-2

Table 3-2 Start-up and Shutdown Duration (Gas Turbines Only) 3-3

Table 3-3 Maximum Emissions during Start-up/Shutdown 3-4

Table 3-4 Maximum Emissions during Start-up/Shutdown 3-5

Table 3-5 Combustion Turbines: Annual Criteria Pollutant Emissions 3-6

Table 3-6 Combustion Turbines: Annual Hazardous Air Pollutant (HAP) Emissions 3-6

Table 3-7 Annual Criteria Pollutant and HAP Emissions from Ancillary Equipment 3-8

Table 3-8 Total Annual Project Emissions 3-9

Table 3-9 Facility Wide HAP Emissions 3-10

Table 4-1 Ambient Air Quality Standards 4-2

Table 4-2 Classification of Warren County, VA, for Each Criteria Pollutant 4-3

Table 4-3 Major Stationary Source Categories with a 100 TPY Threshold 4-4

Table 4-4 PSD Significant Emission Rates 4-5

Table 4-5 PSD *De Minimis* Monitoring Threshold Concentrations 4-7

Table 4-6 Allowable PSD Increments and Significant Impact Levels ($\mu g/m^3$) 4-8

Table 4-7 Summary of Regulatory Requirements of NSPS Subpart A – General Provisions 4-11

Table 5-1 Summary of Selected BACT for the Proposed Mitsubishi M501 GAC Combined Cycle Gas Turbines 5-11

Table 5-2 Summary of BACT for the Combined Cycle Gas Turbine Startup and Shutdown Emissions 5-13

Table 5-3 Selective Catalytic Reduction Capital Costs for the Auxiliary Boiler and Fuel Gas Heater 5-15

Table 5-4 Selective Catalytic Reduction Annual Costs for the Auxiliary Boiler and Fuel Gas Heater 5-16

Table 5-5: Oxidation Catalyst Capital Costs for the Auxiliary Boiler and Fuel Gas Heater 5-18

Table 5-6 Oxidation Catalyst Annual Costs for the Auxiliary Boiler and Fuel Gas Heater 5-19

Table 5-7 Summary of Proposed BACT for the Auxiliary Boiler and Fuel Gas Heater 5-21

List of Figures

Figure 1-1 Regional Topographic Map 1-3

1.0 Introduction

Virginia Electric and Power Company (Dominion) is proposing to construct and operate a combined-cycle combustion turbine electric generating facility in Warren County, Virginia, herein referred to as the "Warren County Combined-Cycle Project" (Project). The facility will be located in lots 3, 5, 6, 7, 8, 9, and 10 of the Warren Industrial Park in Warren County, Virginia. Dominion plans to add a 3 x 3 x 1 power block (three combustion turbines, three heat recovery steam generators, and one steam turbine fueled with natural gas) that operates in combined-cycle mode. Dominion is requesting an air quality permit that will allow three optional plant configurations. The turbines being considered for the proposed project are:

- Option 1 – Three (3) Siemens SGT6-5000F units; or
- Option 2 – Three (3) Mitsubishi M501 GAC units; or
- Option 3 – Three (3) General Electric 7FA05 units.

Duct burners will be installed in the heat recovery steam generators (HRSGs) of the proposed new units. Each combustion turbine will be capable of firing pipeline-quality natural gas. The combined cycle turbines will be equipped with selective catalytic reduction (SCR) to minimize nitrogen oxide (NO_X) emissions and an oxidation catalyst to minimize carbon monoxide (CO) emissions.

The permit application document is presented in three volumes to differentiate between the three proposed plant configurations. Volume II, presented here, will detail operation of proposed Option 2, three Mitsubishi M501 GAC units. Volume I, presented in a separate document, details operation of the proposed Option 1, the operation of three Siemens SGT6-5000F units and Volume III, presented in a separate document, will detail operation of proposed Option 3, three General Electric 7FA05 units.

The proposed facility will also include several pieces of ancillary equipment. This equipment will not change with the turbine options. The list of equipment includes:

- Three (3) Turbine Inlet Chillers
- One (1) Auxiliary Boiler
- One (1) Gas Heater
- One (1) Diesel-Fired Emergency Generator
- One (1) Diesel-Fired Fire Water Pump

The proposed facility will be a "major source" of criteria air pollutants. Dominion is applying to the Virginia Department of Environmental Quality (VA DEQ) for a Prevention of Significant Deterioration (PSD) Construction Permit as required by the VA DEQ.

This application addresses the permitting requirements specified by the VA DEQ under the Virginia Regulations for the Control and Abatement of Air Pollution (VAC), Title 9, Agency 5, Chapter 80. The application is divided into nine additional sections which are outlined in Section 1.4. VA DEQ

application forms and tables are located in Appendix A. Supporting emission calculations and vendor information are presented in Appendix B. Supporting documents for the control technology review are presented in Appendix C. A site plan and plot plan for the proposed project can be found in Appendix D. AER MET supporting information can be found in Appendix E. Dispersion modeling files and supporting information can be found in Appendix F. A complete background emission inventory is provided on the CD in Appendix G. Please note that pending VA DEQ's approval of the emission sources' emission rates and stack parameters, the air dispersion modeling for the project will be finalized, and Sections 6 – 10 and Appendices E- G will be provided as an addendum to Revision 2 of this application.

1.1 Applicant Information

To facilitate VA DEQ's review of this document, individuals familiar with both the facility and the preparation of this application are identified below. The VA DEQ should contact these individuals if additional information or clarification is required during the review process. These contacts include contractors/consultants who have assisted with the preparation of this application under the direction of Dominion.

1.1.1 Applicant's Contacts

Dominion Environmental Contact	Andy Gates Virginia Electric and Power Company 5000 Dominion Boulevard Glen Allen, VA 23060 Telephone (804) 273-2950 Fax (804) 273-2964
Permitting Consultant	Bill Campbell, P.E. AECOM, Inc. 6201 Fairview Road, Suite 400 Charlotte, NC 28210 Telephone (704) 643-5196 Fax (704) 553-6151

1.2 Project Location

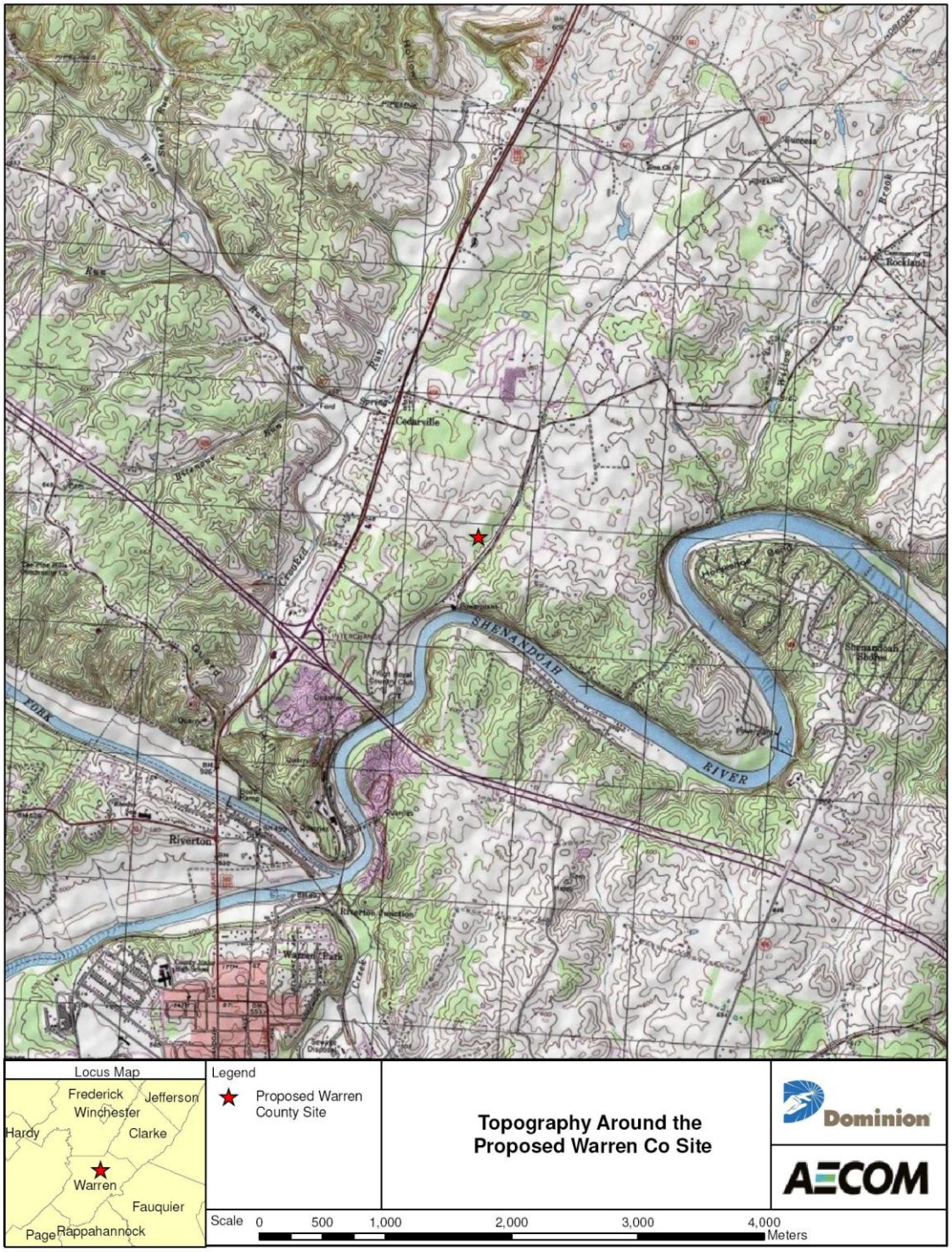
The proposed project will be constructed on a site at Lots 3, 5, 6, 7, 8, 9, and 10 of the Warren Industrial Park in Warren County, Virginia. A topographical map of the site region is shown in Figure 1-1. A site plan for the proposed project is presented in Appendix D.

1.2.1 Surrounding Property

Figure 1-1 shows the land use within the 3-km region surrounding the proposed project. From review of this figure, it is noted that the 3-km region surrounding the site is characterized as primarily rural. Within this predominantly rural area are:

- Agricultural land,
- Forest/undeveloped land, and
- Widely scattered residences.

Figure 1-1 Regional Topographic Map



1.3 Facility Classification

There are two major classification criteria for the proposed expansion of the facility, one related to its industrial character, and the other to its potential to emit air contaminants. The designation of the facility under each of these is reviewed below.

1.3.1 Standard Industrial Classification Code

The United States government has devised a method for grouping all business activities according to their participation in the national commerce system. The system is based on classifying activities into "major groups" defined by the general character of a business operation. For example, electric, gas and sanitary services, which include power production, are defined as a major group. Each major group is given a unique two-digit number for identification. Power production activities have been assigned a major group code “49”.

To provide more detailed identification of a particular operation, an additional two-digit code is appended to the major group code. In the case of power generation facilities the two digit code is “11” in order to define the type of production involved. Thus, the proposed project is classified under the Standard Industrial Classification (SIC) code system as:

- Major Group 49 – Electric, Gas, and Sanitary Services
- Electric Services – 4911

The SIC Code system will eventually be replaced by the North American Industrial Classification System. This system's organization is similar to the SIC codes. Under this system, this facility would be classified under 221112, Fossil Fuel Electric Power Generation.

1.3.2 Air Quality Source Designation

With respect to air quality, new and existing industrial sources are classified as either major or minor sources based on their potential to emit (PTE) air contaminants. This classification is also affected in part by whether the area in which the source is located has attained the National Ambient Air Quality Standards (NAAQS)[1]. An area is classified as attainment if the ambient air quality concentration for a specific pollutant, as measured by a monitor, is below the standard concentration level for a set of averaging periods. The area in which the proposed project is located is designated as attainment for all the NAAQS in which EPA has issued a designation.

For most activities, a major source is defined as one which has the PTE of 250 tons per year (TPY) of any regulated air contaminant. For a special group of 28 industrial activities, the EPA has defined the major source emission threshold to be 100 TPY. Steam-Electric Power Generation is one of these special groups. The proposed project will be classified as a “major stationary source” of air emissions.

---

[1] Criteria pollutants are those for which EPA has established NAAQS and consist of particulate matter with a nominal aerodynamic diameter of 10 microns or less (PM_{10}), carbon monoxide (CO), oxides of nitrogen (NO_x), sulfur dioxide (SO_2), lead and ozone, which is formed through the photochemical reaction of volatile organic compounds (VOC) and NO_x in the atmosphere.

1.4 Document Organization

The balance of this document is divided into sections which address each component of the air quality review. The outline below provides an overview of the contents of each of the remaining sections.

Section 2.0 – Process Description provides a general description of the primary combined-cycle processes by which power will be produced at this site.

Section 3.0 – Emissions Summary presents a detailed review of the emissions during normal operations and startup/shutdown operations which will occur at the Project site subsequent to the completion of project development.

Section 4.0 – Applicable Requirements and Standards presents a discussion of applicable State and/or Federal regulatory programs. The focus of this section will be on establishing which regulations are directly applicable to the proposed combined-cycle turbines and the ancillary equipment and for which compliance must be demonstrated and how it will comply.

Section 5.0 - Control Technology Review is a substantial requirement of the PSD application. Since the proposed project will result in a major source and a significant increase in the emissions of certain criteria pollutants (as defined under PSD regulations), a detailed evaluation of control technologies is provided. Emissions are significant for NO_X, PM, PM_{10}, $PM_{2.5}$, VOC, and CO. As such, "top down" best available control technology (BACT) analyses for these pollutants have been provided.

Pending VA DEQ's approval of the emission sources' emission rates and stack parameters, the air dispersion modeling for the project will be finalized, and Sections 6 – 10 and Appendices E- G will be provided as an addendum to Revision 2 of this application.

Section 6.0 – PSD Class II Modeling Procedures – Significant Impact Level Analysis summarizes the dispersion modeling methodology and the manner in which the predicted impacts will be compared to the applicable standards. Specifically, this section discusses the modeling input data and the various modeling scenarios evaluated.

Section 7.0 – Results of the Class II Area Significant Impact Level (SIL) Analysis and Cumulative Impact Assessment Methodology presents the results of the Class II Area air dispersion analysis performed for the Project. This section compares the predicted impacts to the applicable standards to demonstrate that the Project will operate in compliance.

Section 8.0 – Class I Area Modeling Analysis presents the results of the Class I Area air dispersion modeling analysis performed for the Project.

Section 9.0 – Other Air Quality Issues contains supplemental information regarding the potential impacts of the Project. Specifically, this section discusses the potential for impacts to soils and vegetation, and impacts to the visibility of PSD Class I areas. Compliance with VA Air Toxics rules will be discussed here as well.

Section 10.0 – $PM_{2.5}$ Modeling Analysis presents the $PM_{2.5}$ modeling methodology and air dispersion analysis.

Section 11.0 - References includes a list of the documents relied upon during the preparation of this document.

Appendices - Permit application forms, emission calculations, supporting BACT information, figures and diagrams, dispersion modeling files on computer disc and supplemental materials supporting the information presented herein are contained in the appendices of this document.

2.0 Process Description

As stated previously, Dominion plans to construct a facility in Warren County, Virginia with a 3x3x1 combined-cycle unit. Duct burners will be installed in the heat recovery steam generators (HRSGs). The Project is proposed with three turbine options. This Volume will only discuss Option 2. The key elements of the proposed project include:

- Three Mitsubishi M501 GAC combustion turbine generators
- One reheat condensing steam turbine generator (STG)
- Three supplementary fired HRSGs – one for each turbine
- Three turbine inlet chillers
- One auxiliary boiler
- One fuel gas heater
- One diesel-fired emergency generator
- One diesel-fired fire water pump

The proposed project will have a nominal generating capacity of 1280 MW at ISO conditions with maximum duct firing. Each combustion turbine will be capable of firing pipeline-quality natural gas. Based on the emission calculations, the proposed project will employ Best Available Control Technology (BACT) for nitrogen oxides (NO_X), particulate matter (PM), particulate matter with an aerodynamic diameter less than 10 microns (PM_{10}), particulate matter with an aerodynamic diameter less than 2.5 microns ($PM_{2.5}$), volatile organic compounds (VOC), and carbon monoxide (CO) to minimize air emissions.

2.1 Major Facility Components

The primary sources of pollutants associated with the proposed project are the three Mitsubishi M501 GAC combustion turbine generators (CTGs). Other potential sources of criteria pollutants associated with the proposed project include the turbine inlet chillers, auxiliary boiler, emergency generator, fire water pump, and fuel gas heater. A brief description of the major components of the proposed project is provided in the following sections.

2.1.1 Gas Turbines

The proposed project includes the installation of three advanced firing Mitsubishi M501 GAC class gas turbines in combined-cycle mode, each provided with its own duct-fired HRSG and a common steam turbine generator. The combustion turbines will be fired by pipeline natural gas and annual operation of each combined-cycle combustion turbine will be 8,760 hours per year. The combined cycle turbines will be equipped with selective catalytic reduction (SCR) to minimize nitrogen oxide (NO_X) emissions and an oxidation catalyst to minimize carbon monoxide (CO) emissions. Each gas turbine power block will include an advanced firing temperature combustion turbine air compressor section, gas combustion system (utilizing dry, low NO_X combustors), power turbine, and a generator.

The gas turbine is the main component of a combined-cycle power system. First, air is filtered, cooled and compressed in a multiple stage axial flow compressor. Compressed air and fuel are mixed and combusted in the turbine combustion chamber. Lean pre-mix dry low-NO_X combustors minimize NO_X formation during natural gas combustion. Hot exhaust gases from the combustion chamber are expanded through a multi-stage power turbine that results in energy to drive both the air compressor and electric power generator.

The exhaust gas exiting the power turbine in the combined-cycle turbines is ducted to an unfired boiler commonly known as an HRSG where steam is produced to generate additional electricity in a steam turbine generator. Natural gas fired duct burners located within the HRSGs are used for supplementary firing to increase steam output.

The combustion turbines are designed to operate in the dry low-NO_X mode at loads from approximately 60 percent up to 100 percent rating and will normally be taken out of service for scheduled maintenance, or as dictated by economic or electrical demand conditions.

2.1.2 Heat Recovery Steam Generators

A horizontal, natural circulation, three-pressure level Heat Recovery Steam Generators (HRSG) system will extract heat from the exhaust of each proposed combined-cycle gas turbine. Exhaust gas entering the HRSG at approximately 1,100°F will be cooled to 200°F by the time it leaves the HRSG exhaust stack. Steam production in the HRSGs will be augmented using duct burners that will be fired by natural gas. The heat recovered is used in the combined-cycle plant for additional steam generation and natural gas/feedwater heating. Each HRSG will include high-pressure superheaters, a high-pressure evaporator, high-pressure economizers, reheat sections (to reheat partially expanded steam), an intermediate-pressure superheater, an intermediate-pressure evaporator, an intermediate-pressure economizer, a low-pressure superheater, a low-pressure evaporator, and a low-pressure economizer. The air-cooled condenser will condense the steam exhausting from the STG. As the steam is condensed, the condensate flows to the condensate receiver tank. Control devices such as selective catalytic reduction (SCR) and oxidation catalysts will be installed to control NO_X and CO, respectively.

2.1.3 Steam Turbine

The proposed project includes one reheat, condensing steam turbine designed for variable pressure operation. The high-pressure portion of the steam turbine receives high-pressure super-heated steam from the HRSGs, and exhausts to the reheat section of the HRSGs. The steam from the reheat section for the HRSGs is supplied to the intermediate-pressure section of the turbine, which expands to the low-pressure section. The low-pressure turbine also receives excess low-pressure superheated steam from the HRSGs and exhausts to the surface condenser. The steam turbine set is designed to produce up to approximately 539 MW of electrical output (including duct firing operations).

2.1.4 Turbine Inlet Chillers

Small cooling towers will be incorporated to provide cooling to the chillers used in the inlet cooling system for each turbine. Each of the three turbine inlet chillers (one for each proposed natural gas fired combustion turbine) is equipped with a 6-cell cooling tower.

2.1.5 Auxiliary Boiler

Dominion proposes to add an 88.1 MMBtu/hr auxiliary boiler to supply steam seal to the STG at start-up and at cold starts to warm up the STG rotor. The auxiliary boiler will combust natural gas only. The steam from the auxiliary boiler will not be used to augment the power generation of the CTGs or STG. Dominion requests the boiler to be permitted to operate without annual operating restrictions and the air quality modeling analysis reflects this assumption.

2.1.6 Fuel Gas Heater

Dominion proposes one 52 MMBtu/hr fuel gas heater. The heater will be used as a means to warm up the incoming natural gas fuel to prevent freezing of the gas regulating valves under certain gas system operating conditions. The heater will fire natural gas exclusively. Dominion requests the heater to potentially operate 8,760 hours per year without annual operating restrictions.

2.1.7 Fuel Gas System

Pipeline quality natural gas will be delivered to the plant boundary at a pressure sufficient for use in the CTGs without additional fuel compression.

The gas will first be sent through a knockout drum for removal of any liquid which may have been carried through from the pipeline. The gas then passes through a filter/separator to remove particulate matter and entrained liquid. The gas flows through the filter/separator's first chamber, the filtration section, which removes particulate matter. The gas then flows through the coalescing filters, where entrained liquid is coalesced on the filter cartridges, drops to the bottom of the chamber and either vaporizes and returns to the main gas stream or drains to the sump below. The gas then passes to the second chamber, the separation section, where any entrained liquid remaining in the stream is further separated by impingement on a net or labyrinth and drains to the bottom sump. Three filter/separators are included; one for each CTG. Hydrocarbon liquids in the sump are removed for off-site disposal. The gas is split into three streams, one for each CTG. Finally, the gas is delivered to the CTGs and burned as part of the power generation operation. Similarly, the gas will also be delivered to the auxiliary boiler and three duct burners.

2.1.8 Diesel Fired Emergency Generator

The proposed project will include a 16.91 MMBtu/hr diesel-fired emergency generator that will be operated up to 500 hours per year. The emergency diesel generator will provide power in emergency situations for turning gears, lube oil pumps, auxiliary cooling water pumps and water supply pumps. The emergency diesel generator is not intended to provide sufficient power for a black start.

2.1.9 Diesel Fired Fire Water Pump

The proposed project will include a 2.30 MMBtu/hr diesel-fired fire water pump operated as a fire water pump driver. The unit will be limited to 500 hours per year, including monthly testing and maintenance.

3.0 Criteria and PSD Pollutant Emission Summary

This section presents a summary of the Project emissions and a discussion of the methodology used to calculate emissions. The section is organized by emission sources. Within each emission source section, the methods used to calculate emissions are discussed followed by a summary of the emission estimates for the specific source as well as, in the case of the combustion turbines, mode of operation.

The Project consists of the following equipment:

- Three Mitsubishi M501 GAC combustion turbines arranged in a 3x3x1 configuration
- Three Six-cell Turbine Chillers (Packaged Cooling Tower) - one per turbine
- One Auxiliary Boiler (88 MMBtu/hr)
- One Fuel Gas Heater (52 MMBtu/hr)
- One Emergency Generator (2,193 bhp)
- One Emergency Fire Water Pump (298 bhp)

The emissions calculation procedures used in determining the potential emissions from the Project are based on combustion turbine information provided by the manufacturer, other equipment vendor data, emission limitations specified by the New Source Performance Standards, emission factors documented in U.S. EPA's "Compilation of Air Pollution Emission Factors, AP-42" and proposed BACT emission limits. Operational limitations have been accounted for while estimating potential emissions to make the estimates more representative of on-site conditions.

Detailed emission calculations for each emission source are presented in Appendix B.

3.1 Combustion Turbines

The main sources of emissions at the site are the three combustion turbines. The following subsections present the maximum hourly emissions per turbine during normal operations and start-up/shutdown events, as well as the total annual emissions for all three turbines including start-up/shutdown emissions. Additional details such as turbine data sheets and details of emission control equipment employed on the turbines can be found in Appendix B.

3.1.1 Normal Operations

Normal operation of a combustion turbine is characterized as continuous operation at normal operating loads in the 60% to 100% range. Each of the three turbines is proposed to be operated up to 8,760 hr/yr with 6,000 hr/year to include duct burner firing and the remainder of the time without duct burner firing. Table 3-1 presents the maximum hourly emissions (lb/hr) and the annual emissions (tons per year) for criteria pollutants for two cases: with and without duct burner firing.

Table 3-1 Maximum Hourly and Annual [(a)] Emissions during Normal Operations

Parameter	Mitsubishi M501 GAC			
	Maximum Hourly Emissions Per Turbine during Normal Operations (lb/hr/turbine)		Potential Annual Emission Rates Per Turbine during Normal Operations (tons/year/turbine) [(b)]	
	Combustion w/ Duct Burner (DB) firing	Combustion w/out duct burner firing	Annual Emissions based on DB Firing & CT Only Operating Hour Limits	Annual Emissions Based on CT Only Year-Round
NO_X	25.32	21.70	105.90	95.03
CO	17.41	9.91	65.88	43.38
VOC	6.14	2.64	22.07	11.57
$PM_{10}/PM_{2.5}$	21.16	15.51	84.89	67.95
SO_2	0.98	0.84	4.09	3.67
H_2SO_4	0.88	0.40	3.18	1.74
NH_3	23.39	20.05	97.84	87.80
Lead	0.0017	0.0015	0.007	0.006

(a) See Table B-4 for detailed calculations.

(b) Annual emissions (tons per year) are either based on a combination of 6000 hours per year with duct firing and 2760 hours per year without duct firing or 8760 hours per year of just the turbine operation (no duct firing) depending on which scenario provided the higher annual emissions.

3.1.2 Start-up/Shutdown Operations

Table 3-2 presents the duration of start-up and shutdown events in minutes for each turbine. Maximum emissions (per turbine) of NO_X, CO, PM_{10}, $PM_{2.5}$, SO_2 and VOC during each event of start-up and shutdown operations are shown in Table 3-3. Detailed emissions calculations can be found in Appendix B.

For the emission calculations, the turbines are assumed to startup in sequence; therefore, no more than one turbine will startup at any one time. Short-term emissions resulting from start-up/shutdown operations for the proposed turbines are based on warm starts and cold starts. Each warm start is expected to last 101 minutes and each cold start is expected to last 252 minutes before the turbine reaches its minimum normal operation. To add a measure of conservatism to the emission calculations, it has been assumed that the turbines reach their maximum potential emissions (100% load with duct burners) immediately after the startup (warm/cold). Short-term emissions for the turbines were calculated based on the maximum of either startup/shutdown emissions or a mix of startup/shutdown and normal operation emissions (if the startup period is shorter than the total averaging period). For the averaging periods for which the duration of the startup is shorter than the averaging period, the remaining time (in the averaging period) for each turbine was assumed to be

associated with worst-case load conditions (100% with duct burners). Table 3-4 presents a summary of the startup emissions for each of the short- term averaging periods for the proposed turbines.

Table 3-2 Start-up and Shutdown Duration (Gas Turbines Only)

Duration of Start-up/Shutdown Events (minutes)	
Type of Start	Mitsubishi M501 GAC
Hot Start	43.0
Warm Start	101.0
Cold Start	252.0
Shutdown	14.0

Table 3-3 Maximum Emissions during Start-up/Shutdown

Maximum Emissions Per Turbine during Start-up/Shutdown (lb/stack/event) [(a)]	
Parameter	**Mitsubishi M501 GAC**
NO_X	
Hot start	60.10
Warm start	77.00
Cold start	115.10
Shutdown	23.80
CO	
Hot start	475.50
Warm start	804.20
Cold start	2205.30
Shutdown	142.90
VOC	
Hot start	495.90
Warm start	1495.80
Cold start	3587.80
Shutdown	135.90
$PM_{10}/PM_{2.5}$	
Hot start	4.10
Warm start	8.90
Cold start	23.30
Shutdown	1.30
SO_2	
Hot start	0.23
Warm start	0.49
Cold start	1.28
Shutdown	0.07
(a) See Table B-3 for detailed calculations.	

Annual emissions resulting from start-up/shutdown operations for the proposed turbines are based on 174 hot starts/year, 15 warm starts/year, and 6 cold starts/year. For each hot start, the turbines are offline for 4 hours, for each warm start, the turbines are offline for 40 hours and for each cold start, the turbines are offline for 72 hours. Under this operating scenario, it is estimated that the turbines will remain offline for 1,728 hours/year.

Annual emissions for the proposed turbines were calculated based on the maximum of either 8,760 hr/year of continuous operation or a mix of continuous operation and the maximum number of startup/shutdown events. Table 3-4 provides a summary of the annual emissions including the startup/shutdown emissions for the proposed turbines.

Table 3-4 Maximum Emissions during Start-up/Shutdown

Operating Mode	Hours /Year	Annual Emissions Including Startup/Shutdown									
		NO_X		CO		VOC		$PM_{10}/PM_{2.5}$		SO_2	
		lb/hr	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**
Offline	1,728	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000
Without duct burning	811	21.70	8.80	9.91	4.02	2.64	1.07	15.51	6.29	0.838	0.340
With duct burning	6,000	25.32	75.95	17.41	52.22	6.14	18.42	21.16	63.48	0.978	2.935
Hot start	125	83.86	5.23	663.49	41.37	691.95	43.14	5.72	0.36	0.321	0.020
Warm start	25	45.74	0.58	477.74	6.03	888.59	11.22	5.29	0.07	0.291	0.004
Cold start	25	27.40	0.35	525.07	6.62	854.24	10.76	5.55	0.07	0.305	0.004
Shutdown	46	102.00	2.32	612.43	13.93	582.43	13.25	5.57	0.13	0.300	0.007

3.1.3 Combustion Turbine Emissions: Annual

Annual emissions for the three combustion turbines were calculated based on the maximum of either 8,760 hr/year of continuous operation or a mix of continuous operation and the maximum number of startup/shutdown events. Tables 3-5 and Table 3-6 present the annual emissions (tons/year) of criteria pollutants and HAPs, respectively, for the three turbines arranged in a 3x3x1 configuration.

Table 3-5 Combustion Turbines: Annual Criteria Pollutant Emissions

Combustion Turbines: Annual Criteria Pollutant Emissions [(a)] (Total 3x3x1 Configuration; ton/year)	
Pollutant	**Mitsubishi M501GAC**
NO_X	317.69
CO	372.55
VOC	293.61
$PM_{10}/PM_{2.5}$	254.67
SO_2	12.27
H_2SO_4	9.55
NH_3	293.52
Lead	0.022
(a) See Table B-4 for detailed calculations.	

Table 3-6 Combustion Turbines: Annual Hazardous Air Pollutant (HAP) Emissions

Combustion Turbines: Annual HAP Emissions [(a)] (Total 3x3x1 Configuration; ton/year)	
Pollutant [(b)]	**Mitsubishi M501 GAC**
Formaldehyde	6.29E+00
Hexane	5.56E+00
Toluene	3.59E+00
Xylene	1.76E+00
Acetaldehyde	1.10E+00
Ethylbenzene	8.82E-01
Propylene Oxide	7.99E-01
Benzene	3.37E-01
Acrolein	1.76E-01
PAHs	6.06E-02
Other HAPs	8.03E-02
TOTAL	**20.65**
(a) See Table B-5 for detailed calculations. (b) The highest ten HAPs in terms of emissions are presented in this table. The remaining HAP emissions are presented under the group "Other HAPs".	

3.2 Ancillary Equipment

The facility will include an auxiliary boiler, a fuel gas heater, and turbine chillers to support turbine operations. A firewater pump and a standby generator will also be included on-site to meet the

electricity demands of the facility during power outages and other emergencies. Emissions of criteria pollutants and HAPs from the ancillary equipment are presented in Table 3-6 and detailed emissions calculations can be found in Appendix B (Tables B-6 to B-10).

3.2.1 Auxiliary Boiler

The facility will include a natural gas fired auxiliary boiler which has a heat input rate of 88.1 MMBtu/hr and will operate 8,760 hours/year.

3.2.2 Fuel Gas Heater

The facility will also include a natural gas fired fuel gas heater which has a heat input rate of 52 MMBtu/hr and will operate 8,760 hours/year.

3.2.3 Turbine Chillers

The Project will include three 6-cell turbine chillers with drift eliminators (one per turbine) to provide inlet air chilling for each combustion turbine. PM emissions were calculated using EPA's AP-42 Chapter 13, Section 4, Wet Cooling Towers, Table 13.4-1 (1/95) with a drift eliminator performance of 0.0005%. PM_{10} and $PM_{2.5}$ emissions were calculated from PM based on 71.81% of PM being PM_{10} and 0.22% being $PM_{2.5}$ (based on vendor data).

3.2.4 Emergency Engines

The facility will have a 2,193 bhp emergency generator and a 298 bhp emergency firewater pump. The firewater pump and the emergency generator will meet the emission requirements in EPA's Standards of Performance for Stationary Compression Ignition Internal Combustion Engines, July 11, 2006 (40 CFR Part 60 Subpart IIII). Both the firewater pump and the emergency generator are expected to operate for no more than 500 hours/year for routine testing and maintenance. Emissions of criteria pollutants and HAPs from the emergency engines are presented in Table 3-7 and detailed emissions calculations can be found in Appendix B (Table B-9 and B-10).

Table 3-7 Annual Criteria Pollutant and HAP Emissions from Ancillary Equipment

Annual Criteria Pollutant and HAP Emissions from Ancillary Equipment (tons/year)					
Compound	**Auxiliary Boiler**	**Fuel Gas Heater**	**Turbine Chiller**	**Emergency Generator**	**Emergency Fire Water Pump**
Criteria Pollutants					
Nitrogen Oxides	4.24	2.51	-	5.77	0.49
Carbon Monoxide	14.27	8.43	-	3.16	0.43
NMTOC	2.08	1.23	-	5.77	0.49
Sulfur Oxides	0.11	0.06	-	6.34E-03	8.62E-04
$PM_{10}/PM_{2.5}$	1.93	1.70	1.57E-01 / 4.82E-04	0.36	0.05
Lead	1.89E-04	1.12E-04	-	-	-
H_2SO_4	8.26E-03	4.88E-03	-	-	-
HAPs [(b)]					
Hexane	6.81E-01	4.02E-01	-	-	-
Formaldehyde	2.84E-02	1.67E-02	-	3.33E-04	6.78E-04
Toluene	1.29E-03	7.59E-04	-	1.19E-03	2.35E-04
Benzene	7.94E-04	4.69E-04	-	3.28E-03	5.36E-04
Nickel	7.94E-04	4.69E-04	-	-	-
Chromium	5.30E-04	3.13E-04	-	-	-
Dichlorobenzene	4.54E-04	2.68E-04	-	-	-
Cadmium	4.16E-04	2.46E-04	-	-	-
Naphthalene	2.31E-04	1.36E-04	-	5.49E-04	4.87E-05
Other HAPs	3.96E-04	2.34E-04	-	1.30E-03	7.28E-04
TOTAL HAPs	7.14E-01	4.22E-01	-	6.65E-03	2.23E-03

(a) See Tables B-5 through B-10 for detailed calculations.
(b) The highest ten HAPs in terms of emissions are presented in this table. The remaining HAP emissions are presented under the group “Other HAPs”.

3.3 Project Emissions

Table 3-8 shows the annual potential-to-emit of the Project including the three Mitsubishi M501 GAC combustion turbines and the ancillary equipment. Total HAP emissions from the Project will not exceed 25 tons/year and individual HAP emissions will not exceed 10 tons per year as shown in Table 3-9 (see Table B-5 for details).

Table 3-8 Total Annual Project Emissions

Emission Source Description	NO_X (ton/yr)	SO_2 (ton/yr)	PM_{10} (ton/yr)	$PM_{2.5}$ (ton/yr)	CO (ton/yr)	VOC (ton/yr)	H_2SO_4 (ton/yr)	Lead (ton/yr)
Combustion Turbine #1	105.90	4.09	84.89	84.89	124.18	97.87	3.18	7.17E-03
Combustion Turbine #2	105.90	4.09	84.89	84.89	124.18	97.87	3.18	7.17E-03
Combustion Turbine #3	105.90	4.09	84.89	84.89	124.18	97.87	3.18	7.17E-03
Turbine Inlet Chiller #1			0.16	4.82E-04				
Turbine Inlet Chiller #2			0.16	4.82E-04				
Turbine Inlet Chiller #3			0.16	4.82E-04				
Auxiliary Boiler	4.24	0.11	1.93	1.93	14.27	2.08		1.89E-04
Diesel-Fired Emergency Generator	5.77	6.34E-03	0.36	0.36	3.16	5.77		3.80E-05
Diesel-Fired Fire Water Pump	0.49	8.62E-04	4.90E-02	4.90E-02	0.43	0.49		5.17E-06
Gas Heater	2.51	6.37E-02	1.70	1.70	8.43	1.23		1.12E-04
Total Project Emissions:	**330.70**	**12.45**	**259.18**	**258.71**	**398.83**	**303.18**	**9.55**	**2.18E-02**
Major Source Threshold (TPY)	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Major Source	**Yes**	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**No**	**No**
PSD Threshold for Significant Net Emission Rate	**40**	**40**	**15**	**10**	**100**	**40**	**7**	**0.6**
Proposed Project Subject to PSD?	**Yes**	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**No**

Table 3-9 Facility Wide HAP Emissions

Emission Source Description	HAP Estimates[(a)]
Combustion Turbines	20.65
Ancillary Equipment	1.14
Facility Wide Total	**21.79**
Facility Wide Single Maximum HAP	**6.64 (Hexane)**

(a) See Tables B-5 for detailed calculations.

4.0 Applicable Requirements and Standards

This section presents a review of the air quality regulations that will govern operation of the proposed project. Specifically, the following regulations and standards were reviewed for applicability to the proposed project:

- Prevention of Significant Deterioration (PSD) Regulations;
- Good Engineering Practice (GEP) Stack Height Regulations;
- New Source Performance Standards (NSPS);
- National Emission Standards for Hazardous Air Pollutants (NESHAP);
- Compliance Assurance Monitoring (CAM);
- Acid Rain Program Regulations (ARP);
- Risk Management Program (RMP);
- Title V Permit Program;
- NO_X Budget Trading Program;
- Clean Air Interstate Rule (CAIR);
- Virginia Department of Environmental Quality (VA DEQ), Virginia Administrative Code (VAC); and
- Virginia State Implementation Plan.

The Federal regulatory programs, as administered and delegated by the U.S. Environmental Protection Agency (EPA), have been developed under the authority of the Clean Air Act (CAA or Act) and its amendments. The following subsections review the key elements of the federal regulatory program and the impact they have on the permitting and operation of the proposed project. Attention is placed on National Ambient Air Quality Standards (NAAQS) (40 Code of Federal Regulations [CFR] 50), PSD (40 CFR 52.21), NSPS (40 CFR 60), NESHAP (40 CFR 61, 40 CFR 63), CAM (40 CFR 64), RMP (40 CFR 68), ARP regulations (40 CFR 72, 73, 75, 76, 77), and the NO_X Budget Trading Program (40 CFR 96). Discussion of applicable Virginia regulatory citations is also included in this section.

4.1 Classification with Regard to Ambient Air Quality

The 1970 CAA gave EPA specific authority to establish the minimum level of air quality that all states would be required to achieve. These minimum values or standards were developed to protect the public health (primary) and welfare (secondary). The federally promulgated standards, adopted by Virginia as state standards, are presented in Table 4-1. The Virginia ambient air quality standards also are included in Table 4-1.

Table 4-1 Ambient Air Quality Standards

Pollutant	Averaging Period[2]	NAAQS[1]		Virginia DEQ Regulation Standards[1]	
		Primary	Secondary	Primary	Secondary
Sulfur dioxide (SO_2)	Annual	80	--[3]	80	--[3]
	24-hour	365	--[3]	365	--[3]
	3-hour	--[3]	1,300	--[3]	1,300
Particulate matter (PM) with an aerodynamic diameter less than 10 microns (PM_{10})	24-hour	150	150	150	150
PM with an aerodynamic diameter less than 2.5 microns ($PM_{2.5}$)	Annual	15	15	15	15
	24-hour	35	35	35	35
Carbon monoxide (CO)	8-hour	10,000	--[3]	10,000	--[3]
	1-hour	40,000	--[3]	40,000	--[3]
Ozone (O_3)	8-hour	157	157	157	157
Nitrogen dioxide (NO_2)	Annual	100	100	100	100
	1-hour[4]	188.68	-	-	-
Lead (Pb)	3-month	1.5	--[3]	1.5	--[3]

[1]All standards in this table are expressed in µg/m^3.

[2]National short-term ambient standards may be exceeded once per year; annual standards may never be exceeded. Virginia short-term standards may be exceeded once per year, annual standards may never be exceeded. O_3 standard is attained when the expected number of days of an exceedance is equal to or less than one.

[3]No ambient standard for this pollutant and/or averaging period.

[4] NAAQS value of 100 ppb to be effective April 12, 2010

Source: 40 CFR 52.21, and 9 VAC 5-30

The 1990 CAA Amendments called for a review of the ambient air quality of all regions of the United States (U.S.). By March 15, 1991, states were required to file with EPA designations of all areas as either attainment, non-attainment, or unclassifiable. Areas of the country that had monitored air quality levels equal to or better than these standards (i.e., ambient concentrations less than a standard) as of March 15, 1991, became designated as "attainment areas," while those areas where monitoring data indicated air quality concentrations greater than the standards became known as "non-attainment areas."

The designation of “unclassifiable” indicates that there is insufficient monitoring data to prove that the area has attained the federal standards; however, the limited data available indicates that the standard has been achieved. Areas with this classification are treated by EPA as attainment areas for permitting purposes.

The current federal air quality classifications for the Project area in Warren County are listed in Table 4-2, for each criteria pollutant. These designations were obtained from the July 2004 edition of 40 CFR 81 and updated with later information. The designation of an area has particular importance for a proposed project as it determines the type of permit review to which an application will be subject.

Table 4-2 Classification of Warren County, VA, for Each Criteria Pollutant

Pollutant	Attainment Status
CO	Unclassifiable/Attainment
Sulfur Dioxide (SO_2)	Attainment
Nitrogen Dioxide (NO_2)	Unclassifiable/Attainment
Particulate Matter < 10 µm (PM_{10})	Attainment
Ozone (O_3 - 8-hour)	Unclassifiable/Attainment
Particulate Matter < 2.5 µm $PM_{2.5}$	Unclassifiable/Attainment
Source: 40 CFR 81.347.	

Major new sources or major modifications to existing major sources located in attainment areas are required to obtain a PSD permit prior to initiation of construction. Similar sources located in areas designated as non-attainment or that adversely impact such areas will undergo non-attainment New Source Review (NNSR). In either case, it is necessary, as a first step, to determine the air quality classification of a project site. Dominion assumes that the new NO_2 1-hour standard would be designated unclassifiable due to limited data, and as a result considered attainment.

4.2 PSD Program

4.2.1 PSD Applicability

The determination of whether PSD regulations are applicable to a specific project must be conducted in two parts: first dealing with the air quality status of the location of the Project and second evaluating the type and quantity of PSD-regulated pollutants that will be emitted. For the regulations to apply to a given project, it must first be determined whether the proposed location is in an area that has been classified as attainment or as unclassifiable. Since the facility is located in Warren County, which is designated as attainment or unclassifiable for the criteria pollutants, PSD review will apply as discussed below.

The Project's potential to emit (PTE) is reviewed to determine whether it constitutes a major stationary source or major modification. A major stationary source is defined as either one of the sources identified in 9 VAC 5-80-1615 C (see Table 4-3) and which has a PTE of 100 tons or more per year of any regulated pollutant, or any other stationary source which has the PTE of 250 tons or more per year of a regulated pollutant. A major modification is defined as a source having an increase in

emissions above the PSD significant emission rates, as identified in Table 4-4. Combined-cycle turbines with HRSG are considered a fossil fuel-fired steam electric plant. "Potential to emit" has a special meaning here as it is determined on an annual basis after the application of air pollution control equipment based on the maximum hourly emissions times 8760 hours, or any other practically enforceable restriction that would restrict the hours or the operation of the new emission sources. Once it is determined that a pollutant exceeds the major source threshold, each of the remaining pollutants is subject to PSD review if the PTE exceeds the Significant Emission Rates listed in Table 4-4.

Table 4-3 Major Stationary Source Categories with a 100 TPY Threshold

Fossil Fuel-Fired Steam Electric Plants of More Than 250,000,000 Btu Per Hour Heat Input
Coal Cleaning Plants (with thermal dryers)
Kraft Pulp Mills
Portland Cement Plants
Primary Zinc Smelters
Iron and Steel Mill Plants
Primary Aluminum Ore Reduction Plants
Primary Copper Smelters
Municipal Incinerators Capable of Charging More Than 250 Tons of Refuse Per Day
Hydrofluoric, Sulfuric or Nitric Acid Plants
Petroleum Refineries
Lime Plants
Phosphate Rock Processing Plants
Coke Oven Batteries
Sulfur Recovery Plants
Carbon Black Plants
Primary Lead Smelters
Fuel Conversion Plants
Sintering Plants
Secondary Metal Production Plants
Chemical Processing Plants
Fossil-Fuel Boilers (or combination thereof) Totaling of More Than 250,000,000 Btu Per Hour Heat Input
Petroleum Storage and Transfer Units With a Total Storage Capacity Exceeding 300,000 Barrels
Taconite Ore Processing Plants
Glass Fiber Processing Plants
Charcoal Production Plants
Source: 9 VAC 5-80-1615 C.

Table 4-4 PSD Significant Emission Rates

Pollutant	Significant Emission Rate (tpy)
CO	100
NO_X	40
SO_2	40
PM	25
PM_{10}	15
$PM_{2.5}$	10
O_3	40 of Volatile Organic Compounds (VOCs)
Lead (Pb)	0.6
Fluorides	3
Sulfuric acid mist	7
Total reduced sulfur	10
Reduced sulfur compounds	10
H_2S	10
Source: 9 VAC 5-80-1615 C	

4.2.2 PSD Program Requirements

The following provides a summary of the application requirements for projects subject to PSD.

Best Available Control Technology

The requirements for Best Available Control Technology (BACT) were promulgated within the framework of PSD in the 1977 CAA Amendments. Guidelines for the evaluation of BACT can be found in EPA's Air Pollution Control Cost Manual (EPA 2002) and in the PSD/New Source Review Workshop Manual (EPA 1990 DRAFT). These guidelines were drafted by EPA as a framework or tool for the BACT process. BACT for most states, including Virginia, is determined by the state permitting authority using permitting procedures that have been adopted consistent with the authority granted through EPA's approval of the state PSD program.

The regulatory definition of BACT for affected sources locating in Virginia is:

> *[A]n emissions limitation (including a visible emissions standard) based on the maximum degree of reduction for each regulated NSR pollutant that would be emitted from any proposed major stationary source or major modification that the board, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such source or modification through application of production processes or available methods, systems, and techniques, including fuel cleaning or*

> *treatment or innovative fuel combustion techniques for control of such pollutant. In no event shall application of best available control technology result in emissions of any pollutant that would exceed the emissions allowed by any applicable standard under 40 CFR Parts 60, 61, and 63. If the board determines that technological or economic limitations on the application of measurement methodology to a particular emissions unit would make the imposition of an emissions standard infeasible, a design, equipment, work practice, operational standard, or combination thereof, may be prescribed instead to satisfy the requirement for the application of best available control technology. Such standard shall, to the degree possible, set forth the emissions reduction achievable by implementation of such design, equipment, work practice or operation, and shall provide for compliance by means that achieve equivalent results [9 VAC 5-80-1615 C.]*

Although BACT is typically an emission limit, BACT can also be a work practice standard in certain circumstances, typically if an emission limit is not feasible. One example of a work practice standard that can impact a BACT determination is a limitation on the hours of operation for a source. Another example is the specification of a particular control device in lieu of an emission limit. BACT limits are determined by the "permitting authority" (in this instance the VA DEQ) based on a case-by-case analysis that takes into account site-specific characteristics, including "energy, environmental, and economic costs and other costs" [9 VAC 5-80-1615 C]. BACT does not require a redefinition of the proposed source or the use of unproven technology. BACT is not necessarily the lowest emission level ever seen, but the lowest level achievable by the applicant for the particular proposed source at issue under worst-case foreseeable conditions.

A BACT limit must be "achievable." Generally, "achievable" in the context of BACT means an emission limit that the source can meet on a continual basis over each averaging period for the lifetime of the facility. BACT limits should be set at levels the source can meet under all reasonable foreseeable worst-case conditions. A permitting authority determines what is achievable for a source, exercising its technical judgment on a case-by-case basis.

In addition to being "achievable," a control technology must be "available" to be considered in a BACT determination. To be "available," a control technology must be demonstrated in practice. This means that the technology has progressed beyond the conceptual stage and beyond the research and development or pilot testing phase. The technology must have been demonstrated successfully on full-scale operations for a sufficient time to be considered proven. BACT does not require an applicant to employ technologies that are not proven to work; theoretical, experimental, or developing technologies are not "available" under BACT. Technologies with questionable or dubious reliability are likewise not considered "available" under BACT, and the applicant is not required to use them. Moreover, vendor sales literature about what a technology might be able to achieve in some limited situation is not relevant to a BACT determination.

Finally, BACT is determined on a pollutant-by-pollutant basis. When establishing BACT for individual pollutants, however, a permitting authority must also consider possible interactions among the pollutants as well as other collateral environmental impacts of particular technologies, such as water usage or the creation of a waste stream.

Pursuant to EPA guidance, pending promulgation of the $PM_{2.5}$ implementation rule, PM_{10} is used as a surrogate in meeting New Source Review requirements for $PM_{2.5}$. Consequently, the BACT analysis for the emission sources of $PM_{2.5}$ has been addressed as PM_{10} in this application. Additionally, $PM_{2.5}$ emissions of fine particulates are generally regarded as a subset of PM_{10} emissions of coarse

particulates. In light of EPA guidance and the relationship of $PM_{2.5}$ to PM_{10}, the emissions for $PM_{2.5}$ from the applicable sources are accounted for within the PM_{10} emission estimates in this application document.

Air Quality Monitoring Requirements

In accordance with requirements of 9 VAC 5-80-1735, an application must contain an analysis of existing ambient air quality data in the area to be affected by the proposed project if the Project would result in a net significant emissions increase. The analysis of existing air quality can be air monitoring data from either a state-operated or private network, or by a pre-construction monitoring program that is specifically designed to collect data in the vicinity of the proposed source. The requirement for on site air quality monitoring is based on the impact levels provided in 9 VAC 5-80-1695 E.

Ambient air monitoring for a period of up to 1 year may be required to properly satisfy this monitoring requirement. This condition may be waived if a project would cause an impact less than EPA-specified *de minimis* monitoring levels established by the Virginia State Air Pollution Control Board (see Table 4-5). This potential requirement is discussed further in Section 6.0.

Table 4-5 PSD *De Minimis* Monitoring Threshold Concentrations

Pollutant	Averaging Period	Threshold Concentration ($\mu g/m^3$)
CO	8-hour	575
NO_2	Annual	14
SO_2	24-hour	13
PM/PM_{10}	24-hour	10
O_3	NA	(1)
Lead	3-month	0.1
Fluorides	24-hour	0.25
Total Reduced Sulfur	1-hour	10
Reduced Sulfur Compounds	1-hour	10
H_2S	1-hour	0.2

[1] Exempt if VOC emissions are less than 100 tpy.
Source: 9 VAC 5-80-1695 E

Source Impact Analysis

A source impact analysis must be performed for a proposed project subject to PSD review for each pollutant for which the increase in emissions exceeds the significant emission rate to demonstrate that the Project will not cause or contribute to a violation of NAAQS or PSD increment. The PSD

regulations specifically provide for the use of atmospheric dispersion modeling in performing impact analyses, estimating baseline and future air quality levels, and determining compliance with NAAQS and allowable PSD increments. In accordance with 9 VAC 5-80-1725, designated EPA models, identified in 40 CFR 51, Appendix W, must normally be used in performing air quality analyses. Use of other than EPA-approved models requires written approval and opportunity for public notice and comment prior to use. Guidance for the use and application of dispersion models is presented in the EPA publication Guideline on Air Quality Models (EPA 2003) [2]. The source impact analysis for criteria pollutants may be limited to only the new or modified sources if a net increase in impact due to the new or modified source is below the significant impact levels (SILs) presented in Table 4-6.

Table 4-6 Allowable PSD Increments and Significant Impact Levels (μg/m^3)

Pollutant	Averaging Time	PSD Increments		SILs		NAAQS
		Class I	Class II	Class I	Class II	
PM_{10}	Annual Arithmetic Mean[1]	4	17	0.2	1	50
	24-hour Maximum[2]	8	30	0.3	5	150
SO_2	Annual Arithmetic Mean[1]	2	20	0.1	1	80
	24-hour Maximum[2]	5	91	0.2	5	365
	3-hour Maximum[2]	25	512	1	25	1300
CO	8-hour Maximum	NA	NA	NA	500	10,000
	1-hour Maximum	NA	NA	NA	2000	40,000
NO_2	Annual Arithmetic Mean[1]	2.5	25	0.1	1	100

[1] PSD Increment not to be exceeded
[2] PSD Increment not to be exceeded more than once per year
[3] Class I SILs were proposed in FR July 23, 1996
Notes: NA = Not applicable, i.e., no increment exists.
Source: 40 CFR 50; 40 CFR 51.165, 40 CFR 52.21 and 9 VAC 5-80-1635; 9 VAC 5-80-1715 B.1; 9 VAC 5 Chapter 30

Various periods of meteorological data can be utilized for an impact analysis. However, a 1-year period of onsite data, or a 5-year period of representative meteorological data is normally required. The focus of this modeling effort is to define the “highest” and "highest second-highest" short-term concentration for comparison to NAAQS or PSD increments. The term "highest-second-highest" refers to the highest of the second highest concentrations at all receptor locations. The second-

[2] 40 CFR 51, Appendix W

highest concentration is significant because short-term NAAQS specify that the standards should not be exceeded at any location more than once per year.

PSD Increments

PSD regulations specify that new major sources or modifications to existing major sources may change baseline air quality only by a defined amount. This limited incremental degradation is known as a PSD increment. PSD increments have been established for Class I and Class II areas for PM_{10}, SO_2, and NO_2 (see Table 4-6).

The allowable change, or increment, is dependent on the classification of the area in which the action is to take place. When PSD regulations were first promulgated, three area classifications were proposed based on criteria set in the 1977 CAA.

Class I areas are federally protected areas and include specifically defined national parks, national forests, and wilderness areas. Class III increments are the least restrictive of the three PSD Classes, but to date, no Class III areas have been officially designated. The remainder (and vast majority) of the country (including Warren County) is designated as a Class II area.

Additional Analyses

In addition to the standard air quality analyses, federal regulations require an analysis of the impairment to visibility and the effects on soils and vegetation that would occur as a result of project construction and operation. Impacts due to commercial, residential, industrial, and other growth in the vicinity of the Project also must be addressed to the extent they are a result of the proposed action. This additional analysis is provided in Section 8.0 of this application.

4.3 Good Engineering Stack Height Analysis

The 1977 CAA require that the degree of emission limitation required for control of any pollutant not be affected by a stack which exceeds the GEP height (EPA 1985). Further, no dispersion credit is given during air quality modeling for stacks which exceed GEP. GEP stack height is defined as the highest of:

- 65 meters; or
- A height established by applying the formula:

  HGEP = H + 1.5 L

  Where; HGEP = GEP Stack Height,

  H = Height of the structure or nearby structure, and

  L = Lesser dimension (height or projected width) of the nearby structure; or
- A height demonstrated by fluid modeling or field study.

A structure or terrain feature is considered nearby if a stack is within a distance of five times the structure's height or maximum projected width. Only the smaller value of the height or projected width is used and the distance to the structure cannot be greater than 0.8 kilometer. Although GEP stack

height regulations require that the stack height used in modeling for determining compliance with NAAQS and PSD increments not exceed GEP stack height, the actual stack height may be greater.

The stack height regulations also increase GEP stack height beyond that resulting from the formula in cases where plume impaction occurs. Plume impaction is defined as concentrations measured or modeled to occur when the plume interacts with elevated terrain. Elevated terrain is defined as terrain that exceeds the height calculated by the GEP stack height formula. Based on two criteria cited in a July 8, 1985 Federal Register preamble to the stack height rules discussing the role of terrain in influencing the emitted plume at the source location, there is no significant terrain that would induce downwash within 1/2 km and at least a 10% terrain height relative to the distance from the source. Therefore, plume impaction was not considered in determining the GEP stack height for the proposed project.

All stacks to be constructed at the Project site will each be less than or equal to 65 meters and will be modeled at their actual stack elevation. Therefore, the modeling complies with GEP regulations.

4.4 Applicability of New Source Performance Standards (NSPS)

The NSPS potentially applicable to this project include:

- Subpart A – General Provisions;
- Subpart Dc – Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units;
- Subpart IIII – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines; and
- Subpart KKKK – Standards of Performance for Stationary Combustion Turbines.

Each of these potentially applicable subparts is discussed below.

4.4.1 Subpart A – General Provisions

Certain provisions of 40 CFR Part 60 Subpart A apply to the owner or operator of any stationary source subject to a NSPS. Since the proposed facility will be subject to a NSPS, the proposed project will be required to comply with applicable provisions of Subpart A. Subpart A provisions which impose requirements on the proposed project are identified in Table 4-7.

Table 4-7 Summary of Regulatory Requirements of NSPS Subpart A – General Provisions

40 CFR 60 Subpart A Section	Requirement	Compliance Action
60.7	Initial notification and recordkeeping	Dominion will submit NSPS-related notifications to EPA Region III and Virginia DEQ for the proposed project in a timely manner.
60.8	Performance Tests	Dominion will conduct required performance tests using designated reference test methods.
60.11	Compliance with standards and maintenance requirements	Dominion will operate and maintain the units using good air pollution control practices.
60.13	Monitoring requirements	Dominion will utilize pollutant monitoring methods outlined in 60.13.
60.19	General notification and reporting requirements	Dominion will follow NSPS report and notification formats and schedules set forth in 60.19.

4.4.2 Subpart Dc – Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units

Subpart Dc applies to steam generating units in which construction commenced after June 9, 1989 and that have a maximum design heat input capacity of 100 MMBtu/hr or less, but greater than 10 MMBtu/hr. The proposed auxiliary boiler and the fuel gas heater will both be subject to this Subpart. There are no emission standards, compliance, stack testing, or emission monitoring requirements for natural gas fired boilers or process heaters. The auxiliary boiler and the fuel gas heater will comply with the reporting and recordkeeping requirements listed in the Subpart.

4.4.3 Subpart IIII – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines

The emergency generator and fire water pump are subject to 40 CFR Part 60 Subpart IIII - Standards of Performance for Stationary Compression Ignition Internal Combustion Engines. Because these units meet EPA Tier 3 emission requirements for off-road engines, they will comply with the emission limitations of Subpart IIII. The facility will comply with the monitoring, recordkeeping and reporting requirements applicable to engines used only for emergency purposes.

4.4.4 Subpart KKKK – Standards of Performance for Stationary Combustion Turbine Emissions

The EPA Administrator has promulgated a final rule under 40 CFR 60 Subpart KKKK, "Standards of Performance for Stationary Combustion Turbines" (see 71 FR 38482, July 6, 2006). The regulation applies to each stationary combustion turbine with a heat input at peak load equal to or greater than

10 million Btu per hour based on the higher heating value, which commenced construction, modification, or reconstruction after February 18, 2005.

Only the heat input rate to the combustion turbine should be included when determining whether or not this NSPS is applicable to the proposed turbines. Any additional heat input to the associated heat recovery steam generators (HRSG) or duct burners should not be included when determining the peak heat input. However, the NSPS does apply to emissions from any associated HRSG and duct burners.

The construction of the proposed combustion turbines will commence after February 2005. The peak load heat input rate of each of the turbines (without the heat input of duct burners) is 2,996 MMBtu/hr firing natural gas. Therefore, the proposed combustion turbines are subject to this regulation.

Emission Limits for NO_X

The proposed turbines are subject to an emission standard of 15 ppm at 15 percent O_2 or 0.43 lb/MWh, when fired with natural gas. If the turbines operate in partial load (less than 75 percent of peak load) or if the turbines operate at temperatures less than 0^oF, a NO_X limit of 96 ppm at 15 percent O_2 or 4.7 lb/MWh will apply. If the HRSGs operate independently of the combustion turbines, the turbines will be subject to an emission standard of 54 ppm at 15 percent O_2 or 0.86 lb/MWh, when fired with natural gas.

Dominion has chosen to comply with concentration-based NO_X emission standards. As discussed in Section 5.0, the proposed turbines will reduce NO_X emissions to 2 ppm at 15 percent O_2 using low-NO_X combustors and selective catalytic reduction while burning natural gas.

Therefore, compliance with the above NO_X emission limits is expected. The actual compliance with these emission standards will be verified during the initial performance test. The HRSGs will not be operating independently of the combustion turbines; therefore, the 54 ppm NO_X emission standard is not applicable for these turbines.

Emission Limits for SO_2

The proposed turbines will be subject to an emission limit of 0.9 lb/MWh gross output or the turbines must not burn any fuel which contains the total potential sulfur emissions in excess of 0.06 lb SO_2/MMBtu heat input.

Dominion will comply with input-based emission standard for SO_2. The proposed turbines will burn pipeline quality natural gas. Using 0.1 grains sulfur/100 ft^3 sulfur content and a 1,020 Btu/sft^3 (HHV) heat content for natural gas, the SO_2 emission rate for each turbine is estimated as 0.00028 lb/MMBtu. Therefore, compliance is expected while firing natural gas.

4.5 40 CFR 61 NESHAPs

Under the current provisions of the CAA and implementing regulations, 188 compounds or classes of compounds are regulated under Section 112(b).

The regulations which have been developed to implement Section 112(b) are presented in 40 CFR, Parts 61 and 63. These parts contain a listing of those pollutants that have been designated as being hazardous (Part 61.01, 63.01, 63.74 and Section 112[b] of the Act) as defined in Section 112, and list

these standards applicable to specific industries. Unlike NSPS, NESHAP emission limits or control requirements developed to implement Section 112 of the Act, as amended, are applicable to both new and existing sources that emit pollutants regulated by this Section.

Twenty-three hazardous emission standards were promulgated under the provisions of Section 112 prior to the 1990 CAA Amendments and are found in 40 CFR 61. However, none of these NESHAP standards (40 CFR 61) are applicable to the proposed project.

4.6 40 CFR 63 NESHAPs

A major source of HAPs is any stationary source that has the potential to emit 10 tpy or more of a single HAP or 25 tpy of combined HAPs. As shown in Section 3 and Appendix B, potential HAP emissions will be below the major source thresholds for single and combined HAPs. Thus, the Combustion Turbine MACT (Subpart YYYY) will not apply.

However, the emergency generator and fire water pump engine are subject to Subpart ZZZZ since this standard is applicable to area sources of HAPs. Since the engines are less than 500 hp, the requirements of 40 CFR 60 Subpart IIII must be met in order to meet the requirements of Subpart ZZZZ. The engines will meet the requirements of 40 CFR 60, Subpart IIII as described above in Section 4.4.3.

4.7 Title IV Acid Rain Provisions

The proposed turbines are fossil fuel-fired combustion devices used to generate electricity for sale, and its capacity serves a generator that exceeds 25 MW. Therefore, the proposed boilers meet the definition of an affected Phase II “utility unit” under the Acid Rain Program (ARP) pursuant to Title IV of the 1990 CAA Amendments.

This applicability requires Dominion to:

- Apply for a Phase II Acid Rain Permit to include the new utility units;
- Install CEMS to demonstrate compliance with the ARP provisions meeting the requirements specified in 40 CFR 75; and
- Hold allowances equivalent to annual NO_X and SO_2 emissions.

An Acid Rain permit application must include the date that the units will commence commercial operation and the deadline for monitoring certification (90 days after commencement of commercial operation). Dominion will file the appropriate paperwork to apply for their acid rain permit.

Dominion will operate in compliance with applicable provisions of the Title IV Acid Rain rules as adopted by reference under 9 VAC 5-80-360. The facility also will meet applicable Acid Rain requirements that become effective after the issuance of an Acid Rain permit.

The facility will develop a Title IV Acid Rain monitoring plan as required under 40 CFR 72. The plan will include the installation, proper operation, and maintenance of continuous monitoring systems or approved monitoring provisions under 40 CFR 75 for NO_X, SO_2, CO_2, (as a diluent), and opacity. Depending on the monitoring technology available at the time of installation, the plan will cite the specific operating practices and maintenance programs that will be applied to the instruments. The plan also will cite the specific form of records that will be maintained, their availability for inspection,

and the length of time that they will be archived. The plan will further cite that the Acid Rain permit and applicable regulations will be reviewed at specific intervals for continued compliance and will cite the specific mechanism to be used to keep current on rule applicability.

4.8 Risk Management Program, Section 112(r)

Title III of the 1990 CAA Amendments contains requirements for subject facilities that store and/or process certain hazardous substances for ensuring their safe use. Under these requirements, facilities must identify and assess their hazards and carry out certain activities designed to reduce the likelihood and severity of accidental chemical releases. Section 112(r) of the CAA, codified in 40 CFR Part 68, mandates the EPA to publish rules to develop and implement RMPs for sources with more than the threshold quantity of a listed regulated substance to identify, prevent, and minimize the consequences of accidental releases. The three elements that should be incorporated into an RMP include:

- Hazard Assessment;
- Prevention Program; and
- Emergency Response Program.

The facility will comply with any applicable RMP requirements.

4.9 Applicability of Title V – Major Source Operating Permit

The state of Virginia has been delegated authority to implement the major source operating permit program (Title V) in accordance with the requirements of 40 CFR Part 70 and Title V of the 1990 CAA Amendments. The operating permit regulations are contained in 9 VAC 5-80 Part II Article 1 and are briefly summarized in the following text. The minimum requirements for operating permit application contents are provided in 9 VAC 5-80-80.

The proposed turbines have criteria pollutant emission levels above 100 tpy. 9 VAC 5-80-80 requires “major facilities” to obtain a permit under this section. Therefore, Dominion will submit an amended Title V Operating Permit Application to the state of Virginia, so that it can be deemed complete no later than 12 months after the commencement of operations of the new emission units.

4.9.1 Clean Air Interstate Rule (CAIR)

The combined cycle turbines meet the definition of a CAIR NO_X unit and are subject to the CAIR NO_X limitations under 9 VAC 5-140-1040. As required by 9 VAC 5-140-1200 A, for each CAIR NO_X source required to have a federally enforceable permit, such permit will include the CAIR permit to be administered by the permitting authority. The following requirements pertain to the CAIR NO_X Annual Trading program:

- Prior to operation commencement, Dominion will obtain a CAIR permit, as required by 9 VAC 5-140-1200 A, to be administrated by the DEQ under the authority of 9 VAC 5-80-360 et seq. and 9 VAC 5-140-1010 et seq.
- As of commencement of operation of the facility (the first day the combustion turbines burn fuel), Dominion will comply with the requirements of the CAIR NO_X emission limitations under 9 VAC 5-140-1040.

- Each combined-cycle unit (combustion turbine and heat recovery steam generator) will meet the applicability requirements as provided in 9 VAC 5-140-1040 A.1 and A.2. Dominion shall meet the monitoring, emission calculation, recordkeeping, reporting, and testing requirements as applicable under 9 VAC 5 Chapter 140, Part II, Article 8.

4.10 State Regulatory Review

In general, the VA DEQ retains jurisdiction within Warren County with full delegation from the EPA to enforce the air quality programs under the CAA. The emission sources presented in this document shall comply with applicable VA DEQ regulations promulgated under Title 9 of Agency 5, State Air Pollution Control Board. This section lists the citations of the applicable state regulations with regulatory requirements.

9 VAC 5-20 – General Provisions

The facility will comply with the general provisions as outlined in 9 VAC 5-20.

9 VAC 5-50-20 – Compliance

Sixty days after achieving the maximum production rate, but not later than 180 days after initial startup, the facility shall not operate any new source in violation of any standard of performance under this regulation. The facility will comply with this regulation.

9 VAC 5-50-30 – Performance Testing

This regulation describes the performance testing procedures for new or modified sources. The facility will conduct all performance testing in accordance with these regulations.

9 VAC 5-50-40 – Monitoring

These regulations apply to continuous emissions monitoring systems. The facility will comply with these regulations for any continuous emissions monitoring systems located onsite.

9 VAC 5-50-50 – Notification, Records, and Reporting

These regulations outline the notification, recordkeeping, and reporting requirements for new sources. The facility will comply with these regulations.

9 VAC 5-50-260 – Standard for Stationary Sources and 9 VAC 5-80-1705 – Control Technology Review

The regulation states that “a stationary source shall apply best available control technology for each regulated pollutant that it would have the potential to emit in amounts equal to or greater than the levels in 9 VAC 5-80-1320C.” A best available control technology (BACT) analysis has been conducted for the Project and is located in Section 5.0.

9 VAC 5-80-420 – Standard Requirements

These regulations describe the information needed and limitations for facilities subject to the acid rain program. The proposed facility will comply with these regulations.

9 VAC 5-80-1180 – Standards and Conditions for Granting Permits

These regulations outline the standards required for all facilities for which a permit is granted. The proposed facility will comply with all standards and conditions listed in the regulation.

9 VAC 5-80-1210 – Permit Invalidation, Suspension, Revocation, and Enforcement

This regulation describes the conditions in which a permit may be invalidated, suspended, revoked, or enforcement action may be brought upon the facility.

9 VAC 5-80-1715 – Source Impact Analysis

The proposed facility must demonstrate that the proposed equipment does not have emission increases that would cause or contribute to air pollution in violation of the ambient air quality standards or the maximum allowable increase over the baseline concentration in any area. The facility has conducted modeling to demonstrate compliance with this regulation. The modeling is described in sections 6.0 and 7.0.

9 VAC 5-80-1785 – Source Obligation

These regulations describe the information the proposed facility is required to maintain onsite prior to construction. The proposed facility will comply with this regulation.

5.0 Control Technology Review

5.1 Technical Approach

Dominion proposes to design, construct, and operate a new combined cycle power plant that will burn only natural gas. The plant will have a nominal gross generation capacity of 1280 MW at ISO conditions with maximum duct firing. According to 9 VAC 5-80, the Project must apply Best Available Control Technology (BACT) for those pollutants that are emitted in significant quantities, that is, particulate matter (PM), particulate matter with a diameter of less than 10 microns (PM_{10}), particulate matter with a diameter of less than 2.5 microns ($PM_{2.5}$), nitrogen oxides (NO_X), carbon monoxide (CO), volatile organic compounds (VOC), and sulfuric acid mist (H_2SO_4). In addition, the Project must also apply BACT for those pollutants that are not emitted in significant quantities, such as sulfur dioxide (SO_2) in accordance with Virginia State Air Pollution Control Board on (SAPCB) regulations under 9 VAC 5 Chapter 50. The Project will include the following stationary sources:

- Three Mitsubishi M501 GAC combustion turbine/heat recovery steam generators equipped with duct burners feeding 1 steam turbine with a total approximate gross generation capacity of 1280 MW at ISO conditions with maximum duct firing;.
- One air cooled condenser for the steam turbine (no emissions);
- One 88 MMBtu/hr natural gas fired auxiliary boiler;
- One 52 MMBtu/hr natural gas fuel gas heater;
- One 2,193 hp emergency diesel generator operating on ultra low sulfur diesel fuel;
- One 298 hp emergency fire-water pump operating on ultra low sulfur diesel fuel; and
- Three 10,000 gal/min turbine chillers to provide inlet air chilling for the combustion turbines.

5.1.1 Top-Down BACT Analysis

The Virginia regulations require that applicants for a PSD pre-construction permit conduct a BACT analysis for all regulated pollutants emitted in significant quantities from major stationary sources to demonstrate compliance with the control technology requirements of the PSD regulations in Article 8 of 9 VAC 5 Chapter 80. According to 9 VAC 5-80-1615 C, BACT is defined as:

> *"an emissions limitation (including a visible emissions standard) based on the maximum degree of reduction for each regulated NSR pollutant that would be emitted from any proposed major stationary source or major modification that the board, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such source or modification through application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of such pollutant."*

In no event must application of BACT result in emissions of any pollutant that would exceed those allowed by any applicable requirements in the SAPCB regulations under 9 VAC 5 Chapter 50, New Source Performance Standards under 40 CFR Part 60, or the National Emission Standards for Hazardous Air Pollutants under 40 CFR Parts 61 and 63.

The USEPA and DEQ recommend a "top down" approach to the BACT analysis. The process begins with the identification of the alternative control technologies available for the source category based upon a review of: (1) those technologies required by previous BACT determinations made by the USEPA or the various state agencies; and (2) those technologies applied in practice to the same category or a similar source category by means of technology transfer. The available control technologies are then evaluated to determine whether they are technically feasible for the given application. Those control technologies found to be technically infeasible are eliminated from further consideration, while the remaining control technologies are ranked by their performance levels, from the highest to the lowest performance level. The technically feasible control technologies are then evaluated on the basis of the associated economic, energy and environmental impacts. If an alternative technology, starting with the highest performance level, is eliminated based on any of these criteria, the control technology with the next highest performance level is evaluated until a control technology qualifies as BACT. Historically, the cost effectiveness of alternative control technologies in reducing air pollutant emissions is the principle criteria used by both the USEPA and DEQ in their determinations of BACT. All evaluated control technologies must be capable of meeting the NSPS for the pollutant in question.

According to USEPA guidance, BACT may be achieved by one or a combination of the following: (1) a change in the raw material processes; (2) a process modification; and (3) an add-on control device. A change in raw materials is typically considered for industrial processes that use chemicals, such as solvents, where substitution with a lower emitting chemical may be technically feasible. In this case, natural gas and ultra low sulfur diesel are the lowest emitting fuels.

Similar to changes in raw materials, process modifications are typically considered for industrial processes that use chemicals, where a change in the process methods or conditions may result in lower emissions. The combustion turbines for this project will use state-of-the-art dry low NO_X combustors in order to control NO_X emissions.

5.1.2 State Control Technology Analysis

The DEQ requires the application of best available technology to new stationary sources to be located in the Commonwealth of Virginia (9 VAC 5-50-260). The DEQ defines BACT as *"a standard of performance (including a visible emission standard) based on the maximum degree of emission reduction for any pollutant which would be emitted from any proposed stationary source which the board, on a case-by-case basis, taking into account energy, environmental and economic impacts and other costs, determines is achievable for such source through the application of production processes or available methods, systems and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of such pollutant"* [9 VAC 5-50-240(C)]. In no event must application of BACT result in emissions of any pollutant that would exceed those allowed by any applicable standard under Article 5 (9 VAC 5 Chapter 50). Accordingly, the BACT analysis must also address those pollutants that do not exceed the significance thresholds triggering review under the PSD regulations.

5.1.3 Previous BACT Determinations

Federal and state data sources were reviewed to determine the control technologies that have been applied to combined cycle power plants around the country. The review focused on the types of air pollution control technologies used in these applications, the design and performance of each air pollution control technology, and the incentive for implementing the preferred control measures. The review considered the following databases:

- EPA's RACT/BACT/LAER Clearinghouse which is a national database of recently approved PSD permits for combined cycle power plants;
- EPA Region IV's national combustion turbine data base; and
- Air pollutant emission limits established in the various State Implementation Plans.

Each of these databases has certain limitations that hinder either identifying the control devices currently employed at the power plants or determining the performance levels actually achieved in practice by the control devices. The information found in the USEPA's RACT/BACT/LAER Clearinghouse (RBLC) is provided in Appendix C. Note that some of these projects have been cancelled and others are not yet operating; hence, some of the emission rates have not been demonstrated as achievable in practice.

5.2 Combined Cycle Gas Turbine

5.2.1 BACT for Nitrogen Oxides

Nitrogen Oxides (NO_x) is primarily formed in combustion processes in two ways: 1) the combination of elemental nitrogen and oxygen in the combustion air within the high temperature environment of the combustor (thermal NO_X); and 2) the oxidation of nitrogen contained in the fuel (fuel NO_X). Although natural gas contains free nitrogen, it does not contain fuel bound nitrogen; therefore, NO_X emissions from combustion turbines originate as thermal NO_X only. The rate of formation of thermal NO_X is a function of residence time and free oxygen, and is exponential with peak flame temperature.

"Front end" NO_X control techniques are aimed at controlling thermal NO_X and/or fuel NO_X. The primary front-end combustion controls for gas turbines include water or steam injection and dry low-NO_X combustors. The addition of an inert diluent such as water or steam into the high temperature region of the flame controls NO_X formation by quenching peak flame temperature. This technique can be operationally very hard on the turbine and combustors due to vibration and flame instability. Dry low-NO_X combustors limit peak flame temperature and excess oxygen with lean, pre-mix flames that achieve equal or better NO_X control without the addition of water or steam. Catalytic combustion is an emerging front-end technology which uses an oxidation catalyst within the combustor to produce a lower temperature flame and hence, low-NO_X. Other control methods, known as "back-end" controls, remove NO_X from the exhaust gas stream once NO_X has been formed.

Available control levels and technologies for control of NO_X from large industrial combustion turbines are reviewed in the following sections.

5.2.1.1 Available Combustion Turbine NO_X Control Alternatives

Selective Catalytic Reduction (SCR)

Selective catalytic reduction (SCR) is a process which involves post combustion removal of NO_X from the flue gas with a catalytic reactor. In the SCR process, ammonia injected into the turbine exhaust gas reacts with nitrogen oxides and oxygen to form nitrogen and water. SCR converts nitrogen oxides to nitrogen and water by the following reactions (Cho, 1994):

$$4NO + 4NH_3 + O_2 \rightarrow 4N_2 + 6H_2O \quad (1)$$

$$6NO + 4NH_3 \rightarrow 5N_2 + 6H_2O \quad (2)$$

$$2NO_2 + 4NH_3 + O_2 \rightarrow 3N_2 + 6H_2O \quad (3)$$

$$6NO_2 + 8NH_3 \rightarrow 7N_2 + 12H_2O \quad (4)$$

$$NO + NO_2 + 2NH_3 \rightarrow 2N_2 + 3H_2O \quad (5)$$

The reactions take place on the surface of a catalyst. The function of the catalyst is to effectively lower the activation energy of the NO_X decomposition reaction. Technical factors related to this technology include increased turbine backpressure, exhaust temperature materials limitations, thermal shock/stress during rapid starts, catalyst masking/blinding, reported catalyst failure due to “crumbling”, design of the NH_3 injection system, and high NH_3 slip. SCR using ammonia as a reagent represents the state-of-the-art for back end gas turbine NO_X removal from base load, combined-cycle turbines.

SCONOX™

SCONOX™ is an emerging post-combustion technology that removes NO_X from the exhaust gas stream after formation in the combustion turbine. SCONOX™ employs a potassium carbonate bed that adsorbs NO_X where it reacts to form potassium nitrates. Periodically, a hydrogen gas stream is passed over the bed, resulting in the reaction of the potassium nitrates to re-form the potassium carbonate and the ejection of nitrogen gas and water.

SCONOX™ is reportedly capable of achieving NO_X emission reductions of 90% or more for combustion turbine application, and it is currently operating on several small natural gas-fired turbines. The advantage of SCONOX™ relative to SCR is that SCONOX™ does not require ammonia injection to achieve NO_X emissions control. Similar to SCR, SCONOX™ only operates within a specific temperature range.

SCONOX™ is not technically feasible for application to this project since it is no longer being offered for large combustion turbines. SCONOX™ is considerably more complex than SCR, would consume significantly more water, and would require more frequent cleaning and other maintenance.

Selective Non-Catalytic Reduction (SNCR) and Non-Selective Catalytic Reduction (NSCR)

Two other back-end catalytic reduction technologies, Selective Non-Catalytic Reduction (SNCR) and Nonselective Catalytic Reduction (NSCR), have been used to control emissions from certain other combustion process applications. However, both of these technologies have limitations that make them inappropriate for application to combustion turbines. SNCR requires a flue gas exit temperature in the range of 1,300 to 2,100°F, with an optimum operating temperature zone between 1,600 and 1,900 °F. Simple-cycle combustion turbines have exhaust temperatures of approximately 1,100 °F,

and combined-cycle turbines have exhaust temperatures much lower than simple-cycle turbines. Therefore, additional fuel combustion or a similar energy supply would be needed to create exhaust temperatures compatible with SNCR operation. This temperature restriction and related economic considerations make SNCR infeasible and inappropriate for the proposed combustion turbines. NSCR is only effective in controlling fuel-rich reciprocating engine emissions and requires the combustion gas to be nearly depleted of oxygen (<4% by volume) to operate properly. Since combustion turbines operate with high levels of excess oxygen (typically 14 to 16% O_2 in the exhaust), NSCR is infeasible and inappropriate for the proposed combustion turbines.

Dry Low- NO_X (DLN) Combustors

DLN combustion control techniques reduce NO_X emissions without injecting water or steam (hence "dry"). DLN combustors are designed to control peak combustion temperature, combustion zone residence time, and combustion zone free oxygen, thereby minimizing thermal NO_X formation. This is accomplished by producing a lean, pre-mixed flame that burns at a lower flame temperature and excess oxygen levels than conventional combustors.

DLN combustors have been employed successfully for natural gas-fired combustion turbines for more than fifteen years.

Water or Steam Injection

Water and steam injection are also designed to control peak combustion temperature, combustion zone residence time, and combustion zone free oxygen, thereby minimizing thermal NO_X formation. This technology involves the injection of water or steam into the high temperature region of the flame, which minimizes thermal NO_X formation by quenching peak flame temperature.

Water and steam injection has been employed successfully for nearly thirty years, for both natural gas and oil-fired combustion turbines. Water and steam injection remains the state-of-the-art combustion technology for minimizing NO_X emissions for oil-fired combustion turbines.

Water injection is considered to be technically feasible for combustion turbines for natural gas and oil firing operations.

Other Control Technologies

A number of other combustion turbine NO_X emissions control technologies for combustion turbines are being marketed. These include Catalytica Energy Systems' XONON™ catalytic combustors, BOC Gases' LoTOx™ ozone injection system, Thermal Energy's THERMALLONOx™ phosphorus injection/scrubber system, and Enviroscrub's Pahlmann™ Process, and many others. None of these technologies has reached the commercial development stage for large combustion turbines that will be fired with natural gas, and thus none are considered to be technically feasible for application to this project.

5.2.1.2 Ranking of Available Turbine NO_X Control Technologies

The top level of control for natural gas fired combined cycle gas turbines is selective catalytic reduction (SCR). As shown in Table C-1, one project was permitted at a NO_X emission rate of 1.5 ppmvd at 15% O_2 in the year 2000. However, this project was never built and 1.5 ppmvd at 15% O_2 has not been demonstrated as achievable in practice. Numerous projects have been permitted in the

2.0 to 3.0 ppmvd at 15% O_2 range with averaging times ranging from 1 hour to an annual average. In the 2007 to 2009 time frame, approximately ten projects were permitted at 2.0 ppmvd at 15% O_2 including two LAER determinations.

5.2.1.3 Summary of Combustion Turbine NO_x BACT

BACT for the proposed combustion turbines operating is the use of natural gas with dry low Mitsubishi M501 GAC NO_X burners and selective catalytic reduction. The following emission rates are proposed for the combustion turbines:

- 2.0 ppmvd @ 15% O_2 as a 1-hour rolling average without duct burning; and
- 2.0 ppmvd @ 15% O_2 as a 1-hour rolling average with duct burning.

5.2.2 BACT for Carbon Monoxide (CO)

CO emissions are formed in combustion turbines as a result of incomplete combustion of carbonaceous fuels. Similar to the generation of NO_X emissions, the primary factors influencing the generation of CO emissions are temperature and residence time within the combustion zone. Variations in fuel carbon content have relatively little effect on overall CO emissions. Generally the effect of the combustion zone temperature and residence time on CO emissions generation is the exact opposite of their effect on NO_X emissions generation. Higher combustion zone temperatures and residence times lead to more complete combustion and lower CO emissions, but higher NO_X emissions.

5.2.2.1 Available Combustion Turbine CO Control Alternatives

Oxidation Catalyst

An oxidation catalyst is a post-combustion technology that removes CO from the exhaust gas stream after formation in the combustion turbine. In the presence of a catalyst, CO will react with oxygen present in the exhaust stream, converting it to carbon dioxide. No supplementary reactant is used in conjunction with an oxidation catalyst.

As with SCR catalyst technology for NO_X control, oxidation catalyst systems seek to remove pollutants from the turbine exhaust gas rather than limiting pollutant formation at the source. Unlike an SCR catalyst system, which requires the use of ammonia as a reducing agent, oxidation catalyst technology does not require the introduction of additional chemicals for the reaction to proceed. Rather, the oxidation of CO to CO_2 utilizes the excess air present in the turbine exhaust; and the activation energy required for the reaction to proceed is lowered in the presence of the catalyst. Technical factors relating to this technology include the catalyst reactor design, optimum operating temperature, back pressure loss to the system, catalyst life, and potential collateral increases in emissions of PM_{10} and sulfuric acid mist emissions.

As with SCR, CO catalytic oxidation reactors operate in a relatively narrow temperature range. Optimum operating temperatures for these systems generally fall into the range of 700°F to 1,100°F. At lower temperatures, CO conversion efficiency falls off rapidly. Above 1,200°F, catalyst sintering may occur, thus causing permanent damage to the catalyst. For this reason, the CO catalyst is strategically placed within the proper turbine exhaust lateral distribution (it is important to evenly distribute gas flow across the catalyst) and proper operating temperature at base load design

conditions. Operation at part load, or during startup/shutdown will result in less than optimum temperatures and reduced control efficiency.

Typical pressure losses across an oxidation catalyst reactor (including pressure loss due to ammonium salt formation) are in the range of 0.7 to 1.0 inches of water. Pressure drops in this range correspond roughly to a 0.15 percent loss in power output and fuel efficiency or approximately 0.1 percent loss in power output for each 1.0 inch of water pressure loss.

Catalyst systems are subject to loss of activity over time. Since the catalyst itself is the most costly part of the installation, the cost of catalyst replacement should be considered on an annualized basis. Catalyst life may vary from the manufacturer's typical 3-year guarantee to a 5- to 6-year predicted life. Periodic testing of catalyst material is necessary to predict annual catalyst life for a given installation.

Oxidation catalysts have been employed successfully for two decades on natural gas combustion turbines. An oxidation catalyst is considered to be technically feasible for application to this project.

Good Combustion Practices

Good combustion practices consisting primarily of controlled fuel/air mixing and adequate temperature and gas residence time are used to minimize the formation of CO.

5.2.2.2 Ranking of Available Control Technologies

An oxidation catalyst is a technically feasible control technology and the top level of control for minimizing CO emissions from combined cycle gas turbines firing natural gas.

As shown in Table C-2, only two projects have been permitted at CO emission rates below 2 ppmvd at 15% O_2. However, neither of these two projects has been built and thus demonstrated. Typically, CO emission rates of 2 ppmvd at 15% O_2 to 3.5 ppmvd at 15% O_2 are determined to be BACT and LAER. The higher CO emission rates generally account for the higher emissions associated with duct burning.

5.2.2.3 Summary of Combustion Turbine CO BACT

The use of good combustion control and an oxidation catalyst represent BACT for CO control for the proposed combustion turbines. Emissions depend upon the performance of each turbine, the use of duct burning, and the performance of the oxidation catalyst. The following CO emission rates, based on 85% CO control by an oxidation catalyst, are proposed as BACT for the Mitsubishi M501 GAC combustion turbines:

- 1.5 ppmvd @ 15% O_2 as a 3-hour rolling average without duct burning;
- 2.4 ppmvd @ 15% O_2 as a 3-hour rolling average with duct burning.

5.2.3 BACT for Volatile Organic Compounds

Formation of Volatile Organic Compounds (VOC) emissions in combustion turbines is attributable to the same factors as described for CO emissions in Section 5.2.2 above. VOC emissions are a result of incomplete combustion of carbonaceous fuels, and this is influenced primarily by the temperature and residence time within the combustion zone.

5.2.3.1 Available Combustion Turbine VOC Control Alternatives

Oxidation Catalyst

An oxidation catalyst is a post-combustion technology that removes VOC from the exhaust gas stream after formation in the combustion turbine. In the presence of a catalyst, VOC will react with oxygen present in the exhaust stream, converting it to carbon dioxide and water vapor. The performance of an oxidation catalyst is affected by the VOCs that are actually emitted. No supplementary reactant is used in conjunction with an oxidation catalyst.

An oxidation catalyst is considered to be technically feasible for application to this project.

Good Combustion Practices

Good combustion practices consisting primarily of controlled fuel/air mixing and adequate temperature and gas residence time are used to minimize the formation of VOCs.

5.2.3.2 Ranking of Available Control Technologies

The use of good combustion practices and an oxidation catalyst is the top level of VOC control. Typical VOC emission rates determined to be BACT are in the 1.0 ppmvd at 15% to 2.0 ppmvd at 15% O_2 range as shown in Table C-3. However, there are a few projects with both higher and lower emission rates. Most of the projects with emission rates below 1.0 ppmvd at 15% O_2 have not been built.

5.2.3.3 Summary of Combustion Turbine VOC BACT

The use of good combustion control and an oxidation catalyst represent BACT for VOC control for the proposed combustion turbines. Emissions depend upon the performance of each turbine, the use of duct burning, and the performance of the oxidation catalyst. Available performance guarantees are limited by the low VOC concentrations before control and uncertainties regarding the compounds that are actually emitted. The following VOC emission rates, based on 30% VOC control by an oxidation catalyst, are proposed as BACT for the Mitsubishi M501 GAC combustion turbines:

- 0.7 ppmvd @ 15% O_2 without duct burning; and
- 1.6 ppmvd @ 15% O_2 with duct burning.

5.2.4 BACT for Particulate Matter (PM), Particulate Matter Less than 10 Microns (PM_{10}) and Particulate Matter Less than 2.5 Microns ($PM_{2.5}$)

Particulate matter emissions from combustion turbines are a combination of filterable (front-half) and condensable (back-half) particulate. Filterable particulate matter is formed from impurities contained in the fuels and from incomplete combustion. Condensable particulate emissions, which contribute to PM_{10} and $PM_{2.5}$ but not PM, are attributable primarily to the formation of sulfates and possibly organic compounds. Since approximately 1996, condensable PM_{10} emissions have been measured using EPA Method 202. EPA Method 202 used wet impingers to collect inorganic and organic condensable PM_{10} and $PM_{2.5}$. It is widely recognized that EPA Method 202 has shown inconsistent results and a tendency for the results to be biased high. In March 2009, EPA published, in the Federal Register, dry impinger methods to measure condensable PM_{10} and $PM_{2.5}$. The dry impinger methods, known

as Optional Test Methods 27 and 28 are designed to reduce the problems associated with EPA Method 202.

5.2.4.1 Available PM, PM_{10}, and $PM_{2.5}$ Control Alternatives

When the initial New Source Performance Standard for Stationary Gas Turbines (40 CFR 60 Subpart GG) was promulgated in 1979, the EPA recognized that "particulate emissions from stationary gas turbines are minimal," and noted that particulate control devices are not typically installed on gas turbines and that the cost of installing a particulate control device is prohibitive (EPA, September 1977). Performance standards for particulate control of stationary gas turbines were, therefore, not proposed or promulgated.

The most stringent particulate control method demonstrated for gas turbines is the use of low ash and low sulfur fuel. No add-on control technologies are listed in the RACT/BACT/LAER Clearinghouse listings for combustion turbines. Proper combustion control and the firing of fuels with negligible or zero ash content and a low sulfur content for the combustion turbines is the only control method listed.

Add-on controls, such as electrostatic precipitators (ESPs) or baghouses, have never been applied to commercial gas fired turbines. The use of ESPs and baghouses are considered technically infeasible, and do not represent an available control technology. The maximum PM_{10} concentrations, including condensable PM_{10}, from combined cycle combustion units are approximately 0.002 gr/dscf which is lower than 0.01 gr/dscf, which is a typical baghouse performance specification.

Proper combustion control and the firing of fuels with negligible or zero ash content and a low sulfur content for the combustion turbines is considered to be technically feasible for application to this project.

5.2.4.2 Ranking of Available Control Technologies

The use of good combustion practices and the use of only natural gas is the top level of PM, PM_{10}, and $PM_{2.5}$ control. Limiting the fuel to only natural gas results in much lower emissions than would occur if fuel oil was burned. Typical emission rates determined to be BACT for PM, PM_{10}, and $PM_{2.5}$ are in the 6 to 35 lb/hr range (see Table C-4). However, uncertainty exists with regard to the reported species (PM, PM_{10}, or $PM_{2.5}$), the required test methods, and which emission rates are actually achieved in practice.

5.2.4.3 Summary of Combustion Turbine PM, PM_{10}, and $PM_{2.5}$ BACT

The use of good combustion practices and pipeline quality natural gas is concluded to represent BACT for PM, PM_{10}, and $PM_{2.5}$ control for the proposed combined cycle turbines. The emission rates proposed for the combustion turbines vary depending upon the experience of the manufacturer, the size of turbine, and the resulting available guarantees. The following PM/PM_{10}/$PM_{2.5}$ emission rates are proposed as BACT for the Mitsubishi M501 GAC combustion turbines:

- 15.5 lb/hr without duct burning; and
- 21.2 lb/hr with duct burning.

5.2.5 BACT for SO_2 and Sulfuric Acid Mist

Emissions of SO_2 from combustion turbines are a result of oxidation of fuel sulfur. Sulfuric acid mist emissions (SO_3/H_2SO_4) result from oxidation of fuel sulfur as well as oxidation of SO_2 by the duct burners and catalysts used for NO_X, CO, and VOC control.

5.2.5.1 Available SO_2 and Sulfuric Acid Mist Control Alternatives

The only technically feasible method for SO_2 and sulfuric acid mist emission control is the use of low sulfur fuels. The use of flue gas desulfurization is not technically feasible because the SO_2 emissions from the proposed combustion turbines are two orders of magnitude lower than emission rates achievable using flue gas desulfurization.

5.2.5.2 Ranking of Available Control Technologies

The use of pipeline quality natural gas is the top level of control for SO_2 and sulfuric acid mist. Emissions vary depending upon the sulfur content of the natural gas supply as shown in Table C-5.

5.2.5.3 Summary of Combustion Turbine SO_2 and Sulfuric Acid Mist BACT

The natural gas sulfur content is expected to be 0.1 gr S/100 scf or less. The following SO_2 and sulfuric acid mist emission rates based on a natural gas heating value of 1,020 Btu/scf are proposed for the Mitsubishi M501 GAC combustion turbines:

SO_2

- 0.00028 lb/MMBtu

Sulfuric Acid Mist

- 0.00013 lb/MMBtu without duct burning; and
- 0.00025 lb/MMBtu with duct burning.

5.2.6 Ammonia and Other Combustion Turbine Emissions

Ammonia emissions from combined cycle gas turbine plants using SCR are in the 5 to 10 ppmvd at 15% O_2 range. In order to comply with state pollution prevention requirements, ammonia emissions will be limited to 5 ppmvd at 15% O_2.

For all other pollutants, the use of only pipeline quality natural gas, good combustion practices, and an oxidation catalyst represent BACT.

5.2.7 Combustion Turbine BACT Summary for Continuous Operations

A summary of BACT emission control technologies and emission rates for the SGT6-5000F combustion turbines for continuous operation is presented in Table 5-1.

Table 5-1 Summary of Selected BACT for the Proposed Mitsubishi M501 GAC Combined Cycle Gas Turbines

Pollutant	Mitsubishi M501 GAC
NO_X, ppmvd at 15% O_2	
Without Duct Burning	2.0
With Duct Burning	2.0
CO, ppmvd at 15% O_2	
Without Duct Burning	1.6
With Duct Burning	2.4
VOC, ppmvd at 15% O_2	
Without Duct Burning	0.70
With Duct Burning	1.6
$PM/PM_{10}/PM_{2.5}$, lb/hr	
Without Duct Burning	15.5
With Duct Burning	21.2
SO_2, lb/MMBtu	
Without Duct Burning	2.8E-04 (a)
With Duct Burning	2.8E-04 (a)
Sulfuric Acid Mist, lb/MMBtu	
Without Duct Burning	1.3E-04 (a)
With Duct Burning	2.5E-04 (a)
Ammonia, ppmvd at 15% O_2	
Without Duct Burning	5.0
With Duct Burning	5.0
Other pollutants	Good combustion practices with fuel limited to pipeline quality natural gas

(a) Total S in fuel will be limited to 0.1 gr/100 scf

5.2.8 BACT for Combustion Turbine Startup and Shutdown Emissions

The principal method to limit startup and shutdown emissions is to complete these operations as quickly as possible in accordance with manufacturer's specifications. The duration of a startup event is primarily dependent on the steam turbine temperature and limitations on the rate that the steam turbine temperature can be increased. However, startup requirements are also affected by combustion turbine and heat recovery steam generator temperature requirements. As shown in Tables 3-1 and 3-3, the only pollutants with startup/shutdown emissions that exceed normal emission rates are CO, and VOC.

The Project includes an auxiliary boiler in order to minimize combustion turbine startup times and emissions. Approximately one hour before a cold startup of a combustion turbine, the auxiliary boiler is ramped up to full power in order to raise the steam turbine temperature and minimize startup time. During this one-hour period, the combustion turbine is on turning gear, the turbine and heat recovery steam generator are purged, auxiliary steam is gradually introduced to the turbine gland sealing steam systems, and the primary steam lines are warmed and purged.

After combustion turbine ignition, the turbine is ramped to partial load, and held at this load, sufficient to heat the heat recovery steam generator. The partial load hold point(s) vary depending on the combustion turbine and steam turbine manufacturer requirements. The auxiliary boiler continues to provide steam to the steam turbine until the combustion turbine/heat recovery steam generator can provide the required steam pressures, temperatures, and flows.

Expected emissions for startup and shutdown of one Mitsubishi M501 GAC combustion turbine, based on BACT, are summarized in Table 5-2.

Table 5-2 Summary of BACT for the Combined Cycle Gas Turbine Startup and Shutdown Emissions

	Mitsubishi M501 GAC
Duration of Event	
Cold Start, min	252.0
Warm Start, min	101.0
Hot Start, min	43.0
Shutdown, min	14.0
NO_X Emissions	
Cold Start, lb/event	115.10
Warm Start, lb/event	77.00
Hot Start, lb/event	60.10
Shutdown, lb/event	23.80
CO Emissions	
Cold Start, lb/event	2205.30
Warm Start, lb/event	804.20
Hot Start, lb/event	475.50
Shutdown, lb/event	142.90
VOC Emissions	
Cold Start, lb/event	3587.80
Warm Start, lb/event	1495.80
Hot Start, lb/event	495.90
Shutdown, lb/event	135.90
PM10/PM2.5 Emissions	
Cold start, lb/event	23.30
Warm start, lb/event	8.90
Hot start, lb/event	4.10
Shutdown, lb/event	1.30
SO2 Emissions	
Cold start, lb/event	1.28
Warm start, lb/event	0.49
Hot start, lb/event	0.23
Shutdown, lb/event	0.07

5.3 Auxiliary Boiler and Fuel Gas Heater BACT

Dominion plans to install an 88 MMBtu/hr auxiliary boiler and a 52 MMBtu/hr fuel gas heater with no operating hour limitations. Both the auxiliary boiler and fuel gas heater will burn only pipeline quality natural gas. These are relatively small emission sources. Except for CO emissions, maximum potential emissions for each pollutant from these sources are less than 5 ton/yr.

BACT for Nitrogen Oxides (NO_X) N_{OX} is primarily formed in combustion processes in two ways: 1) the combination of elemental nitrogen and oxygen in the combustion air within the high temperature environment of the combustor (thermal N_{OX}); and 2) the oxidation of nitrogen contained in the fuel (fuel N_{OX}). Although natural gas contains free nitrogen, it does not contain fuel bound nitrogen; therefore, N_{OX} emissions from combustion boilers and heaters originate as thermal N_{OX} only. The rate of formation of thermal N_{OX} is a function of residence time and free oxygen, and is exponential with peak flame temperature.

"Front end" NO_X control techniques are aimed at controlling thermal NO_X and/or fuel NO_X. The primary front-end combustion controls for boilers and heaters are low excess air, low NO_X burners, and ultra low NO_X burners. Selective catalytic reduction can be used to remove NO_X from the exhaust gas stream once NO_X has been formed.

Both ultra low NO_X burners and selective catalytic reduction are capable of limiting NO_X emissions to approximately 0.011 lb/MMBtu or 9 ppmvd at 3% O_2. Data from EPA's RACT/BACT/LAER Clearinghouse (see Tables C-6 and C-7) show that typical BACT emission rates for natural gas fired boilers and fuel gas heaters less than 250 MMBtu/hr are in the 0.035 lb/MMBtu to 0.060 lb/MMBtu range. However, several projects have been permitted in the 0.010 lb/MMBtu to 0.012 lb/MMBtu range including one boiler permitted at 0.012 lb/MMBtu as LAER and one fuel gas heater permitted at 0.021 lb/MMBtu as LAER.

Dominion proposes to burn only pipeline quality natural gas in the auxiliary boiler and fuel gas heater and to use ultra low NO_X burners to limit NO_X emissions to 0.011 lb/MMBtu (approximately 9 ppmvd at 3% O_2). Annual emissions from the auxiliary boiler will be limited to 4.2 ton/yr while emissions from the fuel gas heater will be limited to 2.5 ton/yr.

Although the proposed emission rate appears to be the top level of control based on data from EPA's RACT/BACT/LAER Clearinghouse, it may be technically feasible to achieve lower NO_X emissions by also applying selective catalytic reduction. Tables 5-3 and Table 5-4 present capital and annual costs, respectively, for applying SCR. SCR is not BACT for either the auxiliary boiler or the fuel gas heater due to the very high cost, which is in excess of $50,000 per ton of NO_X emissions controlled as shown in Table 5-4.

Table 5-3 Selective Catalytic Reduction Capital Costs for the Auxiliary Boiler and Fuel Gas Heater

	Auxiliary Boiler	Fuel Gas Heater	Factor	Basis for Cost and Factor
Capacity, MMBtu/hr	**88.1**	**52.0**		
DIRECT COSTS:				
PURCHASED EQUIPMENT				
(a) Primary and Auxiliary Equipment (PE)	$335,000	$235,000	Vendor Data	
(b) Instrumentation & Controls	$33,500	$23,500	10% of PE	EPA[(a)]
(c) Sales Tax	$10,050	$7,050	3% of PE	EPA[(a)]
(d) Freight	$16,750	$11,750	5% of PE	EPA[(a)]
TOTAL PURCHASED EQUIPMENT Cost (PEC):	$395,300	$277,300		
DIRECT INSTALLATION				
(a) Foundations	$31,624	$22,184	8% of PEC	EPA[(a)]
(b) Handling and Erection	$55,342	$38,822	14% of PEC	EPA[(a)]
(c) Electrical	$15,812	$11,092	4% of PEC	EPA[(a)]
(d) Piping	$7,906	$5,546	2% of PEC	EPA[(a)]
(e) Insulation for ductwork	$3,953	$2,773	1% of PEC	EPA[(a)]
(f) Painting	$3,953	$2,773	1% of PEC	EPA[(a)]
TOTAL DIRECT INSTALLATION (DI):	$118,590	$83,190		
TOTAL DIRECT COST (DC):	**$513,890**	**$360,490**		
INDIRECT COSTS				
INDIRECT INSTALLATION				
(a) Engineering & Project Management	$39,530	$ 27,730	10% of PEC	EPA[(a)]
(b) Construction & Field Expenses	$19,765	$13,865	5% of PEC	EPA[(a)]
(c) Contractor Fees	$39,530	$27,730	10% of PEC	EPA[(a)]
(d) Startup Expenses	$7,906	$5,546	2% of PEC	EPA[(a)]
(e) Performance Tests	$3,953	$2,773	1% of PEC	EPA[(a)]
(f) Contingencies	$11,859	$8,319	3% of PEC	EPA[(a)]
TOTAL INDIRECT COST:	**$122,543**	**$85,963**		
TOTAL INSTALLED COST (TIC)	**$636,000**	**$446,000**		

(a) EPA Air Pollution Control Cost Manual, Sixth Edition, Section 4, Page 2-44. EPA/452/B-002-001. January 2002.

Table 5-4 Selective Catalytic Reduction Annual Costs for the Auxiliary Boiler and Fuel Gas Heater

	Auxiliary Boiler	Fuel Gas Heater	Basis for Cost and Factor
Capital Cost			
Total Installed Cost	$636,000	$446,000	
Source Capacity, MMBtu/hr	88.1	52.0	
NO_x Emissions before Control, lb/MMBtu	0.0110	0.0110	Ultra Low NO_x burners
Annual Capacity Factor, %	100%	100%	
NO_x Emissions before Control, ton/yr	4.24	2.51	
NO_x Emissions after Control, lb/MMBtu	0.0020	0.0020	
Control Efficiency, %	81.8%	81.8%	
NO_x Emissions after Control, ton/yr	0.77	0.46	
NO_x Emission Reduction, ton/yr	3.47	2.05	
Annual Costs, $/yr			
Catalyst Annual Cost			
Catalyst Replacement Cost	$197,650	$138,650	50% of primary equipment cost to account for capital and labor costs
Catalyst Life	5.0	5.0	
Annual Costs, $/yr	$ 48,205	$ 33,815	7% interest [(a)]
Urea	$ 1,490	$ 879	1.3 ton urea per ton NO_x removed at a delivered cost of $330/ton
Operating Labor	$ 12,775	$ 12,775	1.0 hr/day at $35/hr
Supervisor	$ 1,916	$ 1,916	15% of operating labor [(a)]
Maintenance Labor	$ 12,775	$ 12,775	1.0 hr/day at $35/hr
Maintenance Materials	$ 12,775	$ 12,775	100% of maintenance labor[(a)]
Electricity	$ 6,174	$ 3,644	0.1 kW/MMBtu/hr for pressure drop and other operating requirements at $0.08/kWh
Overhead	$ 24,145	$ 24,145	60% of oper, maint. & supv labor + maint. material costs [(a)]
Taxes, Insurance, and Administration	$ 25,440	$ 17,840	4% of total installed cost [(a)]
Capital Recovery	$ 41,377	$ 29,012	7.0%, 20 years, 0.1098 x (TIC-catalyst) [(a)]
Total Annual Cost	$187,072	$149,577	
Cost Effectiveness, $ per ton NO_x emission reduction	$ 54,000	$ 72,970	

(a) EPA Air Pollution Control Cost Manual, Sixth Edition, Section 4, Page 2-44. EPA/452/B-002-001. January 2002.

5.3.1 BACT for Carbon Monoxide (CO) and Volatile Organic Compounds (VOCs)

CO emissions are formed in combustion turbines as a result of incomplete combustion of carbonaceous fuels. Similar to the generation of NO_x emissions, the primary factors influencing the generation of CO emissions are temperature and residence time within the combustion zone. Variations in fuel carbon content have relatively little effect on overall CO emissions. Generally, the effect of the combustion zone temperature and residence time on CO emissions generation is the exact opposite of their effect on NO_x emissions generation. Higher combustion zone temperatures and residence times lead to more complete combustion and lower CO emissions, but higher NO_x emissions. Available emission control techniques for CO are good combustion practices and oxidation catalysts.

Both good combustion practices and oxidation catalysts are capable of limiting CO emissions to 0.037 lb/MMBtu, which is equivalent to 50 ppmvd at 3% O_2. Data from EPA's RACT/BACT/LAER Clearinghouse (see Tables C-8 and C-9) show that a typical BACT emission rate for natural gas fired boilers and fuel gas heaters less than 250 MMBtu/hr is in the 0.035 lb/MMBtu to 0.060 lb/MMBtu range.

Although the proposed emission rate appears to be the top level of control based on data from EPA's RACT/BACT/LAER Clearinghouse, it may be technically feasible to achieve lower CO emissions by also applying an oxidation catalyst. Table 5-5 and Table 5-6 present capital and annual costs, respectively, for applying an oxidation catalyst. An oxidation catalyst is not BACT for either the auxiliary boiler or the fuel gas heater due to the very high cost, which is in excess of $8,000 per ton of CO emissions controlled as shown in Table 5-6.

Table 5-5 Oxidation Catalyst Capital Costs for the Auxiliary Boiler and Fuel Gas Heater

	Auxiliary Boiler	Fuel Gas Heater	Factor	Basis for Cost and Factor
Capacity, MMBtu/hr	**88.1**	**52.0**		
DIRECT COSTS:				
PURCHASED EQUIPMENT				
(a) Primary and Auxiliary Equipment (PE)	$60,000	$40,000	Vendor Data	
(b) Instrumentation & Controls	$6,000	$4,000	10% of PE	EPA[(a)]
(c) Sales Tax	$1,800	$1,200	3% of PE	EPA[(a)]
(d) Freight	$3,000	$2,000	5% of PE	EPA[(a)]
TOTAL PURCHASED EQUIPMENT Cost (PEC):	$70,800	$47,200		
DIRECT INSTALLATION				
(a) Foundations	$5,664	$3,776	8% of PEC	EPA[(a)]
(b) Handling and Erection	$9,912	$6,608	14% of PEC	EPA[(a)]
(c) Electrical	$2,832	$1,888	4% of PEC	EPA[(a)]
(d) Piping	$1,416	$944	2% of PEC	EPA[(a)]
(e) Insulation for ductwork	$708	$472	1% of PEC	EPA[(a)]
(f) Painting	$708	$472	1% of PEC	EPA[(a)]
TOTAL DIRECT INSTALLATION (DI):	$21,240	$14,160		
TOTAL DIRECT COST (DC):	**$92,040**	**$61,360**		
INDIRECT COSTS				
INDIRECT INSTALLATION				
(a) Engineering & Project Management	$7,080	$4,720	10% of PEC	EPA[(a)]
(b) Construction & Field Expenses	$3,540	$2,360	5% of PEC	EPA[(a)]
(c) Contractor Fees	$7,080	$4,720	10% of PEC	EPA[(a)]
(d) Startup Expenses	$1,416	$944	2% of PEC	EPA[(a)]
(e) Performance Tests	$708	$472	1% of PEC	EPA[(a)]
(f) Contingencies	$2,124	$1,416	3% of PEC	EPA[(a)]
TOTAL INDIRECT COST:	**$21,948**	**$14,632**		
TOTAL INSTALLED COST (TIC)	**$114,000**	**$76,000**		

(a) EPA Air Pollution Control Cost Manual, Sixth Edition, Section 4, Page 2-44. EPA/452/B-002-001. January 2002.

Table 5-6 Oxidation Catalyst Annual Costs for the Auxiliary Boiler and Fuel Gas Heater

	Auxiliary Boiler	Fuel Gas Heater	Basis for Cost and Factor
Capital Cost			
Total Installed Cost	$114,000	$76,000	
Source Capacity, MMBtu/hr	88.1	52.0	
CO Emissions before Control, lb/MMBtu	0.0370	0.0370	Good combustion practices
Annual Capacity Factor, %	100%	100%	
CO Emissions before Control, ton/yr	14.27	8.43	
CO Emissions after Control, lb/MMBtu	0.0060	0.0060	
Control Efficiency, %	83.8%	83.8%	
CO Emissions after Control, ton/yr	2.31	1.37	
CO Emission Reduction, ton/yr	11.96	7.06	
Annual Costs, $/yr			
Catalyst Annual Cost			
Catalyst Replacement Cost	$70,800	$47,200	100% of primary equipment cost to account for capital and labor costs
Catalyst Life	5.0	5.0	
Annual Costs, $/yr	$17,267	$11,512	7% interest [(a)]
Operating Labor	$12,775	$12,775	1.0 hr/day at $35/hr
Supervisor	$1,916	$1,916	15% of operating labor [(a)]
Maintenance Labor	$12,775	$12,775	1.0 hr/day at $35/hr
Maintenance Materials	$12,775	$12,775	100% of maintenance labor[(a)]
Electricity	$6,174	$3,644	0.1 kW/MMBtu/hr for pressure drop and other operating requirements at $0.08/kWh
Overhead	$24,145	$24,145	60% of oper, maint. & supv labor + maint. material costs [(a)]
Taxes, Insurance, and Administration	$4,560	$3,040	4% of total installed cost [(a)]
Capital Recovery	$4,078	$2,719	7.0%, 20 years, 0.1098 x (TIC-catalyst) [(a)]
Total Annual Cost	$96,465	$85,300	
Cost Effectiveness, $ per ton CO emission reduction	$8,100	$12,100	

(a) EPA Air Pollution Control Cost Manual, Sixth Edition, Section 4, Page 2-44. EPA/452/B-002-001. January 2002.

For VOC emissions, Dominion proposes to burn only pipeline quality natural gas in the auxiliary boiler and fuel gas heater and to use good combustion practices to limit emissions to 0.005 lb/MMBtu. Annual VOC emissions from the auxiliary boiler will be limited to 2.1 ton/yr while emissions from the fuel gas heater will be limited to 1.3 ton/yr.

5.3.2 BACT for Particulate Matter (PM), Particulate Matter, Particulate Matter Less than 10 Microns (PM_{10}) and Particulate Matter Less than 2.5 Microns ($PM_{2.5}$)

Particulate matter emissions from boilers and fuel gas heaters are a combination of filterable (front-half) and condensable (back-half) particulate. Filterable particulate matter is formed from impurities contained in the fuels and from incomplete combustion. Condensable particulate emissions, which contribute to PM_{10} and $PM_{2.5}$ but not PM, are attributable primarily to the formation of sulfates and possibly organic compounds. Since approximately 1996, condensable PM_{10} emissions have been measured using EPA Method 202. EPA Method 202 used wet impingers to collect inorganic and organic condensable PM_{10} and $PM_{2.5}$. It is widely recognized that EPA Method 202 has shown inconsistent results and a tendency for the results to be biased high. In March 2009, EPA published, in the Federal Register, dry impinger methods to measure condensable PM_{10} and $PM_{2.5}$. The dry impinger methods, known as Optional Test Methods 27 and 28 are designed to reduce the problems associated with EPA Method 202.

Good combustion practices and limiting fuel use to only pipeline quality natural gas are proposed as BACT for PM, PM_{10}, and $PM_{2.5}$ emissions from the auxiliary boiler and fuel gas heater. Annual PM, PM_{10}, and $PM_{2.5}$ emissions from the auxiliary boiler and fuel gas heater will each be limited to less than 2 ton/yr.

5.3.3 BACT for SO_2 and Sulfuric Acid Mist

Emissions of SO_2 from the auxiliary boiler and fuel gas heater are a result of oxidation of fuel sulfur. BACT is the use of pipeline quality natural gas.

5.3.4 Other Auxiliary Boiler and Fuel Gas Heater Emissions

BACT for other auxiliary boiler and fuel gas heater emissions is good combustion practices and the use of pipeline quality natural gas.

5.3.5 Auxiliary Boiler and Fuel Gas Heater BACT Summary

A summary of BACT emission control technologies and emission rates for the auxiliary boiler and fuel gas heater is presented in Table 5-7.

Table 5-7 Summary of Proposed BACT for the Auxiliary Boiler and Fuel Gas Heater

Compound	BACT Emission Rate (lb/MMBtu)	Comments
Nitrogen Oxides	0.011	9 ppmvd at 3% O_2
Carbon Monoxide	0.037	50 ppmvd at 3% O_2
VOC	0.005	Based on AP-42 emission factor
$PM/PM_{10}/PM_{2.5}$	0.005 / 0.007	Boiler based on vendor data / Fuel Gas Heater based on AP-42
Sulfur Dioxide	2.80E-04	Pipeline quality natural gas
Sulfuric Acid Mist	2.14E-05	5% Oxidation of S to H_2SO_4
Other Pollutants	Pipeline quality natural gas and good combustion	

5.4 Cooling Tower BACT

Dominion plans to install three small 10,000 gal/min turbine chillers for combustion turbine inlet air chilling. Packaged cooling towers are associated with each of these chillers. A drift rate of 0.0005% is proposed as BACT based on the top level of control (see Table C-10). Emissions of PM, PM_{10}, and $PM_{2.5}$ will be limited to less than 1 ton/yr.

5.5 Emergency Generator and Fire-Water Pump BACT

Operation of both the emergency generator and fire-water pump will be limited to 500 hr/yr. Only ultra low sulfur diesel fuel containing 15 ppm sulfur or less will be burned. Compliance with the recent New Source performance Standard (40 CFR Part 60 Subpart III) is proposed as BACT. BACT emission rates are presented in Appendix B.

6.0 PSD Class II Modeling Procedures – Significant Impact Level Analysis

Pending VA DEQ's approval of the emission sources' emission rates and stack parameters, the air dispersion modeling for the project will be finalized, and Sections 6 – 10 and Appendices E- G will be provided as an addendum to Revision 2 of this application.

7.0 Class II Area Significant Impact Level (SIL) Analysis

Pending VA DEQ's approval of the emission sources' emission rates and stack parameters, the air dispersion modeling for the project will be finalized, and Sections 6 – 10 and Appendices E- G will be provided as an addendum to Revision 2 of this application.

8.0 Class I Area Modeling Analysis

Pending VA DEQ's approval of the emission sources' emission rates and stack parameters, the air dispersion modeling for the project will be finalized, and Sections 6 – 10 and Appendices E- G will be provided as an addendum to Revision 2 of this application.

9.0 Other Air Quality Issues

Pending VA DEQ's approval of the emission sources' emission rates and stack parameters, the air dispersion modeling for the project will be finalized, and Sections 6 – 10 and Appendices E- G will be provided as an addendum to Revision 2 of this application.

10.0 $PM_{2.5}$ Modeling Analysis

Pending VA DEQ's approval of the emission sources' emission rates and stack parameters, the air dispersion modeling for the project will be finalized, and Sections 6 – 10 and Appendices E- G will be provided as an addendum to Revision 2 of this application.

11.0 References

Brode, R., K. Wesson, J. Thurman, and C. Tillerson, 2008. AERMOD Sensitivity to the Choice of Surface Characteristics, Paper #811, Presented at the Air & Waste Management Association Annual Conference, Portland, OR, June 24, 2008.

DeRoeck, Dan, 2009. Personal communication with Mr. Robert Paine of AECOM.

Henry, Ronald, 2002. Just-Noticeable Differences in Atmospheric Haze, J. Air & Waste Manage. Assoc. 52:1238-1243.

National Park Service, 2000. Phase I Report of the Federal Land Managers' Air Quality Related Values Workgroup (FLAG). National Park Service, Air Resources Division; U.S. Forest Service, Air Quality Program; U.S. Fish and Wildlife Service, Air Quality Branch. http://www.nature.nps.gov/air/Pubs/pdf/flag/FlagFinal.pdf.

National Park Service, 2002. Guidance on Nitrogen and Sulfur Deposition Analysis Thresholds. Available at www.nature.nps.gov/air/Pubs/pdf/flag/nsDATGuidance.pdf.

Richards, W.; J. Prouty,; S. Zell; and P. Catizone, 2007. "Refinements of Plume Visibility Thresholds for Apparent Plume Width", *Air and Waste Management Association*: Pittsburgh, PA, 2007.

Shepherd, Don, 2006. Personal communication with Mr. Robert Paine of AECOM.

TRC, 2003. Air Quality Modeling Report in Support of Permit Application for the Proposed CPV Warren Generating Facility: Class I Area Impact Analyses. Prepared for CPV Warren, LLC. TRC Project Number 33445.

U.S. EPA 2008. AERSURFACE User's Guide. EPA-454/B-08-001. U.S. Environmental Protection Agency, Research Triangle Park, NC. . January, 2008.

U.S. EPA 2009. AERMOD Implementation Guide (Revised). U.S. Environmental Protection Agency, Research Triangle Park, NC. March 19, 2009.

US EPA 1980. A Screening Procedure for the Impacts of Air Pollution Sources on Plants, Soils, and Animals. EPA-450/2-81-078. U.S. Environmental Protection Agency, Research Triangle Park, NC 27711.

U.S. EPA 1985. Guideline for the Determination of Good Engineering Practice Stack Height (Technical Support Document for the Stack Height Regulations) - Revised. EPA-450/4-80-023R, U.S. Environmental Protection Agency, Research Triangle Park, NC 27711.

U.S. EPA, 1992. Workbook for Plume Visual Impact Screening and Analysis (Revised), Office of Air Quality Planning and Standards, EPA-454-R-92-023, October.

U.S. EPA 1995. User's Guide for the Industrial Source Complex (ISC3) Dispersion Models. EPA-454/B-95-003a, U.S. Environmental Protection Agency, Research Triangle Park, NC 27711.

U.S. EPA 2004. User's Guide for the AMS/EPA Regulatory Model (AERMOD). EPA-454/B-03-001 (September 2004). Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina.

U.S. EPA 2005. Guideline on Air Quality Models (Revised). Codified in the Appendix W to 40 CFR Part 51. Office of Air Quality Planning and Standards, Research Triangle Park, NC. November.

Zell, S. E.; P.A. Catizone.; and L.W. Richards, 2007. "Effects of Plume Subtended Angle on Visibility Impairment over a Class I Area". Air and Waste Management Association: Pittsburgh, PA, 2007.

Appendix A

Application Forms

Volume II – Appendix A

The following forms are specific to the Mitsubishi Turbines. General information forms and certification information can be found in Volume I – Appendix A of the application package.

FUEL-BURNING EQUIPMENT AND STATIONARY COMBUSTION ENGINES (EXCEPT INCINERATORS) (BOILERS, TURBINES, GAS/DIESEL ENGINES, KILNS, ETC.):

COMPANY NAME Virginia Electric and Power Company	DATE 04/22/2010	REGISTRATION NUMBER 81391

UNIT REF. NO.	EQUIPMENT MANUFACTURER, TYPE AND MODEL NUMBER	DATE OF MFR. OR CONST.	MOD CODE *	MAXIMUM RATED INPUT HEAT CAPACITY FOR EACH FUEL (MILLION BTU/HR)	TYPE OF FUEL	TYPE OF EQUIPMENT (USE CODE A)	MAXIMUM RATED OUTPUT APPROPRIATE TO SOURCE TYPE			USAGE (USE CODE B)
							STEAM QUANTITY (lb/hr)	OUTPUT BRAKE HORSEPOWER (BHP)	ELECTRICAL POWER (KW)	
T-1M	Mitsubishi M501 GAC combustion turbine with duct burner	TBD	4	3,496	Natural Gas	15	-	-	299,600 (CT only)	6
T-2M	Mitsubishi M501 GAC combustion turbine with duct burner	TBD	4	3,496	Natural Gas	15	-	-	299,600 (CT only)	6
T-3M	Mitsubishi M501 GAC combustion turbine with duct burner	TBD	4	3,496	Natural Gas	15	-	-	299,600 (CT only)	6
B-1	Auxiliary Boiler	TBD	4	88.1	Natural Gas	11	-	-	-	1
EG-1	Emergency Generator	TBD	4	16.91	Diesel	16	-	2,193	-	99
FWP-1	Fire Water Pump	TBD	4	2.30	Diesel	16	-	298	-	99
GH-1	Fuel Gas Heater	TBD	4	52.0	Natural Gas	11	-	-	-	4

* FOR MODIFICATION CODES SEE INSTRUCTIONS ON NEXT PAGE.

Code A - Equipment

BOILER TYPE:
1. Pulverized Coal - Wet Bottom
2. Pulverized Coal - Dry Bottom
3. Pulverized Coal - Cyclone Furnace
4. Spreader Stoker
5. Chain or Travelling Grate Stoker
6. Underfeed Stoker
7. Hand Fired Coal
8. Oil, Tangentially Fired
9. Oil, Horizontally Fired (except rotary cup)
10. Gas, Tangentially Fired
11. Gas, Horizontally Fired

Code A (continued)

12. Wood with Flyash Reinjection
13. Wood without Flyash Reinjection
14. Other Specify

STATIONARY ENGINE TYPE:
15. Combustion Turbine
16. Internal Combustion Engine
17. Other Specify

OTHER COMBUSTION UNITS:
18. Oven / Kiln
19. Rotary Kiln
20. Process Furnace
99. Other Specify

Code B - Usage

1. Steam Production
2. Drying / Curing
3. Space Heating
4. Process Heat
5. Food Processing
6. Electrical Generation
7. Mechanical Work
99. Other

PROCESSING, MANUFACTURING, SURFACE COATING AND DEGREASING OPERATIONS:

COMPANY NAME Virginia Electric and Power Company	DATE 04/22/2010	REGISTRATION NUMBER 81391

UNIT REF. NO.	MOD CODE	PROCESS OR OPERATION NAME	EQUIPMENT MANUFACTURER, TYPE AND MODEL NUMBER	DATE OF MFR. OR CONST.	MAXIMUM RATED CAPACITY __GAL/HR**	MAXIMUM EXPECTED FEED INPUT** / MAXIMUM EXPECTED FEED OUTPUT**		
						_GAL/HR	_____/DAY	_____/YEAR
IC-1	4	Turbine Inlet Chiller	To Be Determined	TBD	600,000	600,000	-	-
						600,000	-	-
IC-2	4	Turbine Inlet Chiller	To Be Determined	TBD	600,000	600,000	-	-
						600,000	-	-
IC-3	4	Turbine Inlet Chiller	To Be Determined	TBD	600,000	600,000	-	-
						600,000	-	-

* Include flow diagram (process schematic) relating process steps and a narrative description including feed materials, product materials, reaction intermediates and by-products; attach appropriate MSDS or CPDS for raw materials used or consumed and products manufactured or handled. For modification codes see next page.

** Specify units for each operation in Tons, Pounds, Gallons, etc., as applicable. Maximum Expected Feed Input for state operating permits shall be based on historical high or attach justification.

STACK PARAMETERS AND FUEL DATA:

COMPANY NAME Virginia Electric and Power Company	DATE 04/22/2010	REGISTRATION NUMBER 81391

		VENT/STACK OR EXHAUST DATA						FUEL(S) DATA						
UNIT REF. NO.	VENT/ STACK NO.	VENT/ STACK CONFIG (USE CODE K)	VENT STACK HEIGHT (feet)	EXIT DIA. (feet)	EXIT GAS VELOCITY (fpm)	EXIT GAS VOLUME (acfm)	EXIT GAS TEMP (°F)	TYPE OF FUEL	MAX. RATED BURNED/ HOUR (SPECIFY UNITS)	MAX. EXPECTED BURNED/ DAY (SPECIFY UNITS)	MAX. EXPECTED BURNED/ YEAR (SPECIFY UNITS)	HIGHER HEATING VALUE (SPECIFY UNITS)	MAX. % SULFUR	MAX. % ASH
T-1M[a]	1	1	175	22	3,837.6	1,458,894	192.3	Natural Gas				3,496 MMBtu/hr	0.1 grains /100 scf	-
T-2M[a]	2	1	175	22	3,837.6	1,458,894	192.3	Natural Gas				3,496 MMBtu/hr	0.1 grains /100 scf	-
T-3M[a]	3	1	175	22	3,837.6	1,458,894	192.3	Natural Gas				3,496 MMBtu/hr	0.1 grains /100 scf	-
B-1	4	1	115	3	3,660	25,744	300	Natural Gas	0.0864 MMcf/hr		756.5 MMcf/yr	88.1 MMBtu/hr	0.1 grains /100 scf	-
EG-1	5	1	20	1.23	8,100	9,669	987	Diesel	119.9 gal/hr		59,950 gal/yr	16.91 MMBtu/hr	0.0015 lb/MMBtu	-
FWP-1	6	1	20	0.44	8,100	1,230	845	Diesel	16.3 gal/hr		8,150 gal/yr	2.30 MMBtu/hr	0.0015 lb/MMBtu	-
GH-1	7	1	45	3.33	1,920	16,746	300	Natural Gas	0.0510 MMcf/hr	1.224 MMcf/day	446.76 MMcf/yr	52 MMBtu/hr	0.1 grains /100 scf	-
IC-1[b]	8	1	42.875	12	1,470	166,000	70	N/A						
IC-2[b]	9	1	42.875	12	1,470	166,000	70	N/A						
IC-3[b]	10	1	42.875	12	1,470	166,000	70	N/A						

[a] – The exit gas velocity and exit gas volumes are an annual average.
[b] – Each turbine chiller contains 6 stacks for a total of 18 stacks.

Code K - Vent/Stack Configuration

1. Unobstructed vertical discharge
2. Obstructed vertical discharge (e.g., raincap)
3. Horizontal or downward discharge (e.g., T-stack)
99. Other (specify)

AIR POLLUTION CONTROL AND MONITORING EQUIPMENT:

COMPANY NAME Virginia Electric and Power Company	DATE 04/22/2010	REGISTRATION NUMBER 81391

UNIT REF. NO.	MOD CODE	VENT/ STACK NO.	DEVICE REF. NO.	POLLUTANT/ PARAMETER (See instructions)	AIR POLLUTION CONTROL EQUIPMENT				MONITORING INSTRUMENTATION
					MANUFACTURER AND MODEL NUMBER	TYPE (USE CODE L)	% EFFICIENCY		SPECIFY TYPE, MEASURED POLLUTANT, AND RECORDER USED
							DESIGN	ACTUAL	
T-1M	4	1	SCR-1	NO_x and CO	To Be Determined	99 – Selective Catalytic Reduction	See Appendix B	-	CEMS
T-1M	4	1	OXCat-1	CO	To Be Determined	99 – Oxidation Catalyst	See Appendix B	-	CEMS
T-2M	4	2	SCR-2	NO_x and CO	To Be Determined	99 – Selective Catalytic Reduction	See Appendix B	-	CEMS
T-2M	4	2	OXCat-2	CO	To Be Determined	99 – Oxidation Catalyst	See Appendix B	-	CEMS
T-3M	4	3	SCR-3	NO_x and CO	To Be Determined	99 – Selective Catalytic Reduction	See Appendix B	-	CEMS
T-3M	4	3	OXCat-3	CO	To Be Determined	99 – Oxidation Catalyst	See Appendix B	-	CEMS
IC-1	4	8	ME-1	PM/PM_{10}	To Be Determined	8	See Appendix B	-	N/A
IC-2	4	9	ME-2	PM/PM_{10}	To Be Determined	8	See Appendix B	-	N/A
IC-3	4	10	ME-3	PM/PM_{10}	To Be Determined	8	See Appendix B	-	N/A

Code L - AIR POLLUTION CONTROL EQUIPMENT TYPE

1. Settling Chamber
2. Cyclone
3. Multicyclone
4. Cyclone scrubber
5. Orifice scrubber
6. Mechanical scrubber
7. Venturi scrubber
   (a) fixed throat
   (b) variable throat
8. Mist eliminator
9. Electrostatic Precipitator
   (a) hot side
   (b) cold side
   (c) high voltage
   (d) low voltage
   (e) single stage
   (f) two stage
   (g) other (specify)
10. Filter
   (a) baghouse
   (b) other (specify)
11. Catalytic Afterburner
12. Direct Flame Afterburner
13. ABSORBER
   (a) packed tower
   (b) spray tower
   (c) tray tower
   (d) venturi
   (e) other (specify)
14. ADSORBER
   (a) activated carbon
   (b) molecular sieve
   (c) activated alumina
   (d) silica gel
   (e) other (specify)
15. Condenser (specify)
99. Other (specify)

AIR POLLUTION CONTROL EQUIPMENT - SUPPLEMENTAL INFORMATION:

COMPANY NAME Virginia Electric and Power Company	DATE 04/22/2010	REGISTRATION NUMBER 81391

DEVICE REF. NO.	TYPE (Use Code L)	LIQUID FLOW RATE(gpm) (Codes 4,5, 6,7,13,15)	LIQUID MEDIUM (Codes 4,5,6,7, 13,15)	CLEANING METHOD (Codes 9, 10,13,14)	NUMBER OF FIELDS (Code 9)	NUMBER OF SECTIONS (Codes 9,10)	AIR-TO- CLOTH RATIO (fpm) (Code 10)	FILTER MATERIAL (Code 10)	INLET TEMP (EF)	REGENERATION METHOD & CYCLE TIME (sec) (Code 14)	CHAMBER TEMP. (EF) (Codes 11,12)	RETENTION TIME (sec) (Codes 11,12)	PRESSURE DROP (in. H_2O) (if Codes 3,4,5,6,7, 10,13)
			Not Applicable										

Code L - AIR POLLUTION CONTROL EQUIPMENT TYPE

1. Settling Chamber
2. Cyclone
3. Multicyclone
4. Cyclone scrubber
5. Orifice scrubber
6. Mechanical scrubber
7. Venturi scrubber
   (a) fixed throat
   (b) variable throat
8. Mist eliminator
9. Electrostatic Precipitator
   (a) hot side
   (b) cold side
   (c) high voltage
   (d) low voltage
   (e) single stage
   (f) two stage
   (g) other (specify)
10. Filter
   (a) baghouse
   (b) other (specify)
11. Catalytic Afterburner
12. Direct Flame Afterburner
13. ABSORBER
   (a) packed tower
   (b) spray tower
   (c) tray tower
   (d) venturi
   (e) other (specify)
14. ADSORBER
   (a) activated carbon
   (b) molecular sieve
   (c) activated alumina
   (d)silica gel
   (e) other (specify)
15. Condenser (specify)
99. Other (specify)

PROPOSED MAXIMUM CRITERIA POLLUTANT EMISSIONS:

COMPANY NAME Virginia Electric and Power Company	DATE 04/22/2010	REGISTRATION NUMBER 81391

UNIT REF. NO.	MOD CODE	*MAXIMUM* EMISSION RATES TO ATMOSPHERE OF *CRITERIA* POLLUTANTS														STATE OPERATING PERMIT EMISSION CAP (Yes/No)	BASIS OF ESTIMATE (USE CODE M)
		PM * (PARTICULATE MATTER)		PM_{10}* (10 µM OR SMALLER PARTICULATE MATTER)		SO_2 (SULFUR DIOXIDE)		NO_X (NITROGEN OXIDES)		CO (CARBON MONOXIDE)		VOC* (VOLATILE ORGANIC COMPOUNDS)		Pb (LEAD)			
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr		
T-1M	4	21.16	84.9	21.16	84.9	0.98	4.1	25.3	105.9	17.4	124.2	6.1	97.9	0.0017	0.007	No	99 - Manufacturer
T-2M	4	21.16	84.9	21.16	84.9	0.98	4.1	25.3	105.9	17.4	124.2	6.1	97.9	0.0017	0.007	No	99 - Manufacturer
T-3M	4	21.16	84.9	21.16	87.9	0.98	4.1	25.3	105.9	17.4	124.2	6.1	97.9	0.0017	0.007	No	99 - Manufacturer
B-1	4	0.44	1.93	0.44	1.93	0.03	0.11	0.97	4.24	3.26	14.27	0.47	2.08	4.3E-05	1.9E-04	No	3 - BACT
EG-1	4	0.72	0.18	1.44	0.36	2.54E-02	6.34E-03	23.08	5.77	12.62	3.16	23.08	5.7	-	-	No	3 – NSPS and AP-42
FWP-1	4	0.10	0.02	0.20	0.05	3.45E-03	8.62E-04	1.96	0.49	1.72	0.43	1.96	0.49	-	-	No	3 – NSPS and AP-42
GH-1	4	0.39	1.70	0.39	1.70	0.01	0.06	0.57	2.51	1.92	8.43	0.28	1.23	2.50E-05	1.10E-04	No	3 – BACT and AP-42
IC-1	4	0.05	0.22	0.04	0.16	-	-	-	-	-	-	-	-	-	-	No	3 – AP-42
IC-2	4	0.05	0.22	0.04	0.16	-	-	-	-	-	-	-	-	-	-	No	3 – AP-42
IC-3	4	0.05	0.22	0.04	0.16	-	-	-	-	-	-	-	-	-	-	No	3 – AP-42

Code M - Emission Estimate Method (provide detailed calculations including assumed control efficiency of control equipment to support reported values.)

1. Stack Test (include a copy of summary)
2. Material Balance (include calculations)
3. Emission Factor (identify source) and include calculations

99. Other (describe)

***** PM, PM_{10}, and VOCs should also be split up by component and reported under TOXIC OR HAZARDOUS POLLUTANTS.

SOURCE-WIDE TOXIC OR HAZARDOUS AIR POLLUTANT (HAP) EMISSIONS FROM THE PROPOSED FACILITY:

COMPANY NAME Virginia Electric and Power Company	DATE 04/22/2010	REGISTRATION NUMBER 81391

SOURCE-WIDE MAXIMUM EMISSION RATES TO ATMOSPHERE OF POLLUTANT (Specify pollutant)*						**TOXIC OR HAP WAS ALSO REPORTED ON PAGE 15 AS:(PM/PM_{10} /VOC or N/A)	STATE OPERATING PERMITS EMISSION CAP (YES/NO)	BASIS OF ESTIMATES (USE CODE M)	UNIT REF. NO.	MOD CODES	VENT/ STACK NO.
TOXIC OR HAZARDOUS POLLUTANT (HAP) NAME	CAS #	IF CONTROLLED AS PROPOSED		WITHOUT THE PROPOSED CONTROLS							
		lb/hr	tons/yr	lb/hr	tons/yr						
1,3-Butadiene	106-99-0	2.79E-03	1.19E-02	3.95E-03	1.69E-02	N/A	No	3 – AP-42	T-1M, T-2M, T-3M, FWP-1	4	1, 2, 3, 6
Acetaldehyde	75-07-0	2.54E-01	1.10E+00	3.62E-01	1.58E+00	N/A	No	3 – AP-42	T-1M, T-2M, T-3M, FWP-1, EG-1	4	1, 2, 3, 5, 6
Acrolein	107-02-8	4.06E-02	1.76E-01	5.79E-02	2.52E-01	N/A	No	3 – AP-42	T-1M, T-2M, T-3M, FWP-1, EG-1	4	1, 2, 3, 5, 6
Benzene	71-43-2	9.32E-02	3.42E-01	1.26E-01	4.87E-01	N/A	No	3 – AP-42	T-1M, T-2M, T-3M, B-1, FWP-1, EG-1, GH-1	4	1, 2, 3, 4, 5, 6, 7
Dichlorobenzene	106-46-7	1.40E-03	4.43E-03	1.93E-03	6.02E-03	N/A	No	3 – AP-42	T-1M, T-2M, T-3M, B-1, GH-1	4	1, 2, 3, 4, 7
Ethylbenzene	100-41-4	2.01E-01	8.82E-01	2.88E-01	1.26E+00	N/A	No	3 – AP-42	T-1M, T-2M, T-3M	4	1, 2, 3
Formaldehyde	50-00-0	1.48E+00	6.34E+00	2.10E+00	9.04E+00	N/A	No	3 – AP-42	T-1M, T-2M, T-3M, B-1, FWP-1, EG-1, GH-1	4	1, 2, 3, 4, 5, 6, 7
Hexane	110-54-3	2.10E+00	6.64E+00	2.89E+00	9.02E+00	N/A	No	3 – AP-42	T-1M, T-2M, T-3M, B-1, GH-1	4	1, 2, 3, 4, 7
Naphthalene	91-20-3	1.13E-02	3.87E-02	1.51E-02	5.48E-02	N/A	No	3 – AP-42	T-1M, T-2M, T-3M, B-1, FWP-1, EG-1, GH-1	4	1, 2, 3, 4, 5, 6, 7
PAHs	-	1.38E-02	6.06E-02	1.98E-02	8.66E-02	N/A	No	3 – AP-42	T-1M, T-2M, T-3M	4	1, 2, 3
Propylene Oxide	75-56-9	1.82E-01	7.99E-01	2.61E-01	1.14E+00	N/A	No	3 – AP-42	T-1M, T-2M, T-3M	4	1, 2, 3
Toluene	108-88-3	8.27E-01	3.60E+00	1.18E+00	5.14E+00	N/A	No	3 – AP-42	T-1M, T-2M, T-3M, B-1, FWP-1, EG-1, GH-1	4	1, 2, 3, 4, 5, 6, 7
Xylene	1330-20-7	4.07E-01	1.76E+00	5.79E-01	2.52E+00	N/A	No	3 – AP-42	T-1M, T-2M, T-3M, FWP-1, EG-1	4	1, 2, 3, 5, 6
Arsenic	-	2.08E-03	1.00E-03	2.08E-03	1.00E-03	N/A	No	3 – AP-42	T-1M, T-2M, T-3M, B-1, GH-1	4	1, 2, 3, 4, 7

SOURCE-WIDE MAXIMUM EMISSION RATES TO ATMOSPHERE OF POLLUTANT (Specify pollutant)*						**TOXIC OR HAP WAS ALSO REPORTED ON PAGE 15 AS:(PM/PM_{10} /VOC or N/A)	STATE OPERATING PERMITS EMISSION CAP (YES/NO)	BASIS OF ESTIMATES (USE CODE M)	UNIT REF. NO.	MOD CODES	VENT/ STACK NO.
TOXIC OR HAZARDOUS POLLUTANT (HAP) NAME	CAS #	IF CONTROLLED AS PROPOSED		WITHOUT THE PROPOSED CONTROLS							
		lb/hr	tons/yr	lb/hr	tons/yr						
Beryllium	-	1.25E-04	6.02E-05	1.25E-04	6.02E-05	N/A	No	3 – AP-42	T-1M, T-2M, T-3M, B-1, GH-1	4	1, 2, 3, 4, 7
Cadmium	-	1.15E-02	5.51E-03	1.15E-02	5.51E-03	N/A	No	3 – AP-42	T-1M, T-2M, T-3M, B-1, GH-1	4	1, 2, 3, 4, 7
Chromium	-	1.46E-02	7.02E-03	1.46E-02	7.02E-03	N/A	No	3 – AP-42	T-1M, T-2M, T-3M, B-1, GH-1	4	1, 2, 3, 4, 7
Cobalt	-	8.75E-04	4.21E-04	8.75E-04	4.21E-04	N/A	No	3 – AP-42	T-1M, T-2M, T-3M, B-1, GH-1	4	1, 2, 3, 4, 7
Manganese	-	3.96E-03	1.91E-03	3.96E-03	1.91E-03	N/A	No	3 – AP-42	T-1M, T-2M, T-3M, B-1, GH-1	4	1, 2, 3, 4, 7
Mercury	-	2.71E-03	1.30E-03	2.71E-03	1.30E-03	N/A	No	3 – AP-42	T-1M, T-2M, T-3M, B-1, GH-1	4	1, 2, 3, 4, 7
Nickel	-	2.19E-02	1.05E-02	2.19E-02	1.05E-02	N/A	No	3 – AP-42	T-1M, T-2M, T-3M, B-1, GH-1	4	1, 2, 3, 4, 7
Selenium	-	2.50E-04	1.20E-04	2.50E-04	1.20E-04	N/A	No	3 – AP-42	T-1M, T-2M, T-3M, B-1, GH-1	4	1, 2, 3, 4, 7

Code M - Emission Estimate Method (provide detailed calculations including assumed control efficiency of control equipment, if applicable)

1. Stack Test (include a copy)
2. Material Balance (include calculations)
3. Emission Factor (identify)
99. Other (describe)

* Toxic Pollutant means a pollutant on the designated list at the front of this application. Particulate matter and volatile organic compounds are not toxic pollutants as generic classes of substances, but individual substances within these classes may be toxic pollutants because their toxic properties or because a TLV (tm) has been established. See the toxic pollutant listing in the front of this application.

** Specify which pollutants are also reported as components of PM, PM_{10}, or VOC on page 15.

OPERATING PERIODS: (Optional use, to establish restriction on operating hours.)

COMPANY NAME Virginia Electric and Power Company	DATE 04/22/2010	REGISTRATION NUMBER 81391

UNIT REF. NO.	PERCENT ANNUAL USE/THROUGHPUT BY SEASON				NORMAL PROCESS/EQUIPMENT OPERATING SCHEDULE			MAXIMUM EQUIPMENT/PROCESS OPERATING SCHEDULE		
	DECEMBER -------- FEBRUARY	MARCH ----- MAY	JUNE ------ AUGUST	SEPTEMBER --------- NOVEMBER	HOURS PER DAY	DAYS PER WEEK	WEEKS PER YEAR	HOURS PER DAY	DAYS PER WEEK	WEEKS PER YEAR
T-1M	25	25	25	25				24	7	52
T-2M	25	25	25	25				24	7	52
T-3M	25	25	25	25				24	7	52
B-1	25	25	25	25				24	7	52
EG-1	25	25	25	25				1*	1*	52
FWP-1	25	25	25	25				1*	1*	52
GH-1	25	25	25	25				24	7	52
IC-1	25	25	25	25				24	7	52
IC-2	25	25	25	25				24	7	52
IC-3	25	25	25	25				24	7	52

MAXIMUM FACILITY OPERATING SCHEDULE		
HOURS PER DAY	DAYS PER WEEK	WEEKS PER YEAR
24	7	52

* The schedule provided for the emergency generator and fire-water pump engine represents non-emergency use for testing purposes. Emergency and non-emergency use will be limited to 500 hours/year.

Appendix B

Vendor Information and Emission Calculations

Appendix B
Emission Calculations

Table	Page
Table B-1 Maximum Potential Project Emissions Mitsubishi M501 GAC	B-1
Table B-2 Mitsubishi M501 GAC Detailed Operating and Emissions Calculations	B-2
Table B-3 Annual Emissions with Startups and Shutdowns - Mitsubishi M501GAC	B-8
Table B-4 Maximum Annual Emissions with Startups and Shutdowns - Mitsubishi M501 GAC	B-9
Table B-5 Hazardous Air Pollutant Emissions - Mitsubishi M501GAC	B-10
Table B-6 Auxiliary Boiler Emissions	B-13
Table B-7 Fuel Gas Heater Emissions	B-14
Table B-8 Turbine Chiller Emissions	B-15
Table B-9 Emergency Generator Emissions	B-16
Table B-10 Emergency Fire-Water Pump Emissions	B-17

Table B-1 Maximum Potential Project Emissions Mitsubishi M501 GAC

Potential Emissions

Emission Source Description	NO_x (ton/yr)	SO_2 (ton/yr)	PM_{10} (ton/yr)	$PM_{2.5}$ (ton/yr)	CO (ton/yr)	VOC (ton/yr)	H_2SO_4 (ton/yr)	Lead (ton/yr)
New Combustion Turbine #1	105.90	4.09	84.89	84.89	124.18	97.87	3.18	7.17E-03
New Combustion Turbine #2	105.90	4.09	84.89	84.89	124.18	97.87	3.18	7.17E-03
New Combustion Turbine #3	105.90	4.09	84.89	84.89	124.18	97.87	3.18	7.17E-03
New Turbine Inlet Chiller #1			0.16	4.82E-04				
New Turbine Inlet Chiller #2			0.16	4.82E-04				
New Turbine Inlet Chiller #3			0.16	4.82E-04				
New Auxiliary Boiler	4.24	0.11	1.93	1.93	14.27	2.08		1.89E-04
New Diesel-Fired Emergency Generator	5.77	6.34E-03	0.36	0.36	3.16	5.77		3.80E-05
New Diesel-Fired Fire Water Pump	0.49	8.62E-04	4.90E-02	4.90E-02	0.43	0.49		5.17E-06
New Gas Heater	2.51	6.37E-02	1.70	1.70	8.43	1.23		1.12E-04
Total Project Emissions:	**330.70**	**12.45**	**259.18**	**258.71**	**398.83**	**303.18**	**9.55**	**2.18E-02**
Major Source Threshold (TPY)	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Major Source	**Yes**	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**No**	**No**
PSD Threshold for Significant Net Emission Rate	**40**	**40**	**15**	**10**	**100**	**40**	**7**	**0.6**
Proposed Project Subject to PSD?	**Yes**	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**No**

Note:
Facility is located in Warren County which is designated as an attainment area for all pollutants.
Emissions rates are rounded off.

Table B-2 Mitsubishi M501 GAC Detailed Operating and Emissions Calculations

	Combined-Cycle: Duct Burner Firing				
Operating Case Number	12	13	14	15	16
CT LOAD/DB Load	100/100	100/100	100/100	100/100	100/100
Inlet Chilling	Off	Off	Off	On	On
Ambient Temperature (°F)	0	59	100	59	100
Relative Humidity	90	60	40	60	40
Atmospheric Pressure	14.40	14.40	14.4	14.4	14.4
Estimated Performance					
Gas Turbine Load (%)	100	100	100	100	100
Fuel Type	GAS	GAS	GAS	GAS	GAS
Fuel LHV (Btu/lb)	20,377	20,377	20,377	20,377	20,377
Fuel HHV (Btu/lb)	22,589	22,589	22,589	22,589	22,589
Gas Turbine Power Output (kW)	299,600	255,500	221,700	263,100	263,100
Gas Turbine Heat Input (MMBtu/hr LHV)[a]	*2,702*	*2,353*	*2,111*	*2,409*	*2,409*
Gas Turbine Heat Input (MMBtu/hr **HHV**)	2,996	2,608	2,341	2,670	2,670
Gas Turbine Exhaust Mass Flow (klbs/hr)	5,579	4,985	4,537	5,070	5,070
Gas Turbine Exhaust Temperature (deg F)	1,102	1,127	1,156	1,123	1,123
Duct Burner Heat Input (MMBtu/hr HHV)	500	500	500	500	500
Duct Burner Fuel Flow (klbs/hr)	22.135	22	22	22	22
Total Heat Input (MMBtu/hr HHV)	3,496	3,108	2,841	3,170	3,170
Gas turbine exhaust analysis, % Vol.					
Argon	0.94	0.93	0.92	0.93	0.93
Nitrogen	74.84	74.24	73.09	74.07	74.07
Oxygen	12.10	12.17	12.01	12.07	12.07
CO2	4.13	4.01	3.93	4.03	4.03
Water	8.00	8.65	10.04	8.89	8.89
Molecular weight	28.47	28.39	28.22	28.36	28.36
O2 % dry basis	13.15	13.32	13.35	13.25	13.25
Gas turbine emissions before control					
NO_X ppmvd @ 15% O2	15.0	15.0	15.0	15.0	15.0
NO_X lb/MMBtu	0.0543	0.0543	0.0543	0.0543	0.0543
NO_X lb/hr (as NO2)	162.7	141.7	127.1	145.1	145.1
CO ppmvd @ 15% O2	10.0	10.0	10.0	10.0	10.0
CO lb/MMBtu	0.0220	0.0220	0.0220	0.0220	0.0220
CO lb/hr	66.0	57.5	51.6	58.9	58.9
VOC ppmvd @15% O2	1.0	1.0	1.0	1.0	1.0
VOC lb/MMBtu	0.0013	0.0013	0.0013	0.0013	0.0013
VOC lb/hr (as CH4)	3.77	3.29	2.95	3.36	3.36
$PM_{10}/PM_{2.5}$ lb/MMBtu HHV	0.0050	0.0050	0.0050	0.0050	0.0050
$PM_{10}/PM_{2.5}$ lb/hr (front and back)	14.98	13.04	11.70	13.35	13.35
Sulfur content of gas, grains/100 scf	0.10	0.10	0.10	0.10	0.10
SO_2, lb/MMBtu (HHV)	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04
SO_2, lb/hr	0.84	0.73	0.65	0.75	0.75
Percent S to H_2SO_4	8.0	8.0	8.0	8.0	8.0
H_2SO_4 lb/MMBtu (HHV)	3.43E-05	3.43E-05	3.43E-05	3.43E-05	3.43E-05
H_2SO_4 lb/hr	0.103	0.089	0.080	0.092	0.092

Table B-2 Mitsubishi M501 GAC Detailed Operating and Emissions Calculations

	Combined-Cycle: Duct Burner Firing				
Operating Case Number	12	13	14	15	16
CT LOAD/DB Load	100/100	100/100	100/100	100/100	100/100
Inlet Chilling	Off	Off	Off	On	On
Ambient Temperature (°F)	0	59	100	59	100
Relative Humidity	90	60	40	60	40
Atmospheric Pressure	14.40	14.40	14.4	14.4	14.4
Duct burner emissions before control					
NO_X lb/MMBtu (as NO_2)	0.10	0.10	0.10	0.10	0.10
NO_X lb/hr (as NO2)	50.00	50.00	50.00	50.00	50.00
CO lb/MMBtu	0.10	0.10	0.10	0.10	0.10
CO lb/hr	50.0	50.0	50.0	50.0	50.0
VOC lb/MMBtu	0.010	0.010	0.010	0.010	0.010
VOC lb/hr (as CH4)	5.00	5.00	5.00	5.00	5.00
$PM_{10}/PM_{2.5}$ lb/MMBtu HHV	0.010	0.010	0.010	0.010	0.010
$PM_{10}/PM_{2.5}$ lb/hr (front and back)	5.00	5.00	5.00	5.00	5.00
SO_2, lb/MMBtu (HHV)	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04
SO_2, lb/hr	0.14	0.14	0.14	0.14	0.14
Percent S to H_2SO_4	*8.0*	*8.0*	*8.0*	*8.0*	*8.0*
H_2SO_4 lb/MMBtu (HHV)	3.43E-05	3.43E-05	3.43E-05	3.43E-05	3.43E-05
H_2SO_4 lb/hr	0.017	0.017	0.017	0.017	0.017
Post duct burner exhaust analysis, % Vol.					
Argon	0.93	0.92	0.91	0.92	0.92
Nitrogen	74.34	73.70	72.51	73.54	73.54
Oxygen	10.70	10.61	10.30	10.53	10.53
CO2	4.78	4.74	4.73	4.75	4.75
Water	9.25	10.04	11.54	10.25	10.25
Molecular weight	28.39	28.30	28.13	28.28	28.28
O2 % dry basis	11.79	11.79	11.64	11.73	11.73
Total Emissions before control					
NO_X ppmvd @ 15% O2	16.8	17.0	17.2	17.0	17.0
NO_X lb/MMBtu	0.0609	0.0617	0.0624	0.0615	0.0615
NO_X lb/hr (as NO2)	212.7	191.7	177.1	195.1	195.1
CO ppmvd @ 15% O2	15.1	15.7	16.2	15.6	15.6
CO lb/MMBtu	0.0332	0.0346	0.0358	0.0343	0.0343
CO lb/hr	116.0	107.5	101.6	108.9	108.9
VOC ppmvd @15% O2	2.0	2.1	2.2	2.1	2.1
VOC lb/MMBtu	0.0025	0.0027	0.0028	0.0026	0.0026
VOC lb/hr (as CH4)	8.77	8.29	7.95	8.36	8.36
$PM_{10}/PM_{2.5}$ lb/hr (front and back)	19.98	18.04	16.70	18.35	18.35
$PM_{10}/PM_{2.5}$ lb/MMBtu HHV	0.0057	0.0058	0.0059	0.0058	0.0058
SO_2, lb/MMBtu (HHV)	0.00028	0.00028	0.00028	0.00028	0.00028
SO_2, lb/hr	0.98	0.87	0.79	0.89	0.89
H_2SO_4 lb/MMBtu (HHV)	3.43E-05	3.43E-05	3.43E-05	3.43E-05	3.43E-05
H_2SO_4 lb/hr	0.120	0.107	0.097	0.109	0.109

Table B-2 Mitsubishi M501 GAC Detailed Operating and Emissions Calculations

	Combined-Cycle: Duct Burner Firing				
Operating Case Number	12	13	14	15	16
CT LOAD/DB Load	100/100	100/100	100/100	100/100	100/100
Inlet Chilling	Off	Off	Off	On	On
Ambient Temperature (°F)	0	59	100	59	100
Relative Humidity	90	60	40	60	40
Atmospheric Pressure	14.40	14.40	14.4	14.4	14.4
Total Emissions after control					
NO_X ppmvd @ 15% O2	2.0	2.0	2.0	2.0	2.0
NOx lb/MMBtu	0.00724	0.00724	0.00724	0.00724	0.00724
NO_X lb/hr (as NO2)	25.32	22.51	20.57	22.96	22.96
CO Emission Reduction - % Decrease	85.0	85.0	85.0	85.0	85.0
CO ppmvd @ 15% O2	2.26	2.35	2.43	2.34	2.34
CO lb/MMBtu	0.0050	0.0052	0.0054	0.0052	0.0052
CO lb/hr	17.41	16.12	15.24	16.33	16.33
VOC Emission Reduction - % Decrease	*30*	*30*	*30*	*30*	*30*
VOC ppmvd @ 15% O2	1.39	1.48	1.55	1.47	1.47
VOC lb/MMBtu	0.0018	0.0019	0.0020	0.0018	0.0018
VOC lb/hr (as CH4)	6.14	5.80	5.56	5.85	5.85
Potential conversion of H_2SO_4 to ammonium sulfate	100	100	100	100	100
Increase in $PM_{10}/PM_{2.5}$ emissions from inlet H_2SO_4	0.16	0.14	0.13	0.15	0.15
Increase in $PM_{10}/PM_{2.5}$ emissions from H_2SO_4 conversion by controls	1.02	0.91	0.83	0.93	0.93
$PM_{10}/PM_{2.5}$ lb/MMBtu HHV	0.0061	0.0061	0.0062	0.0061	0.0061
$PM_{10}/PM_{2.5}$ lb/hr (front and back)	21.16	19.09	17.66	19.42	19.42
SO_2, lb/MMBtu (HHV)	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04
SO_2 lb/hr	0.98	0.87	0.79	0.89	0.89
Percent S to H2SO4 by controls	55	55	55	55	55
H2SO4 formed by controls (lb/hr)	0.76	0.67	0.62	0.69	0.69
H2SO4 lb/MMBtu (HHV)	2.51E-04	2.51E-04	2.51E-04	2.51E-04	2.51E-04
H2SO4 lb/hr	0.88	0.78	0.71	0.80	0.80
NH3 Consumption (klbs/hr)	0.4902	0.4406	0.4066	0.4489	0.4489
NH3 ppmvd @ 15% O2	*5.0*	*5.0*	*5.0*	*5.0*	*5.0*
NH3 lb/MMBtu (HHV)	0.0067	0.0067	0.0067	0.0067	0.0067
NH3 lb/hr	23.4	20.8	19.0	21.2	21.2
Stack data					
Total Heat Input (MMBtu/hr HHV)	3,496	3,108	2,841	3,170	3,170
Stack Diameter, ft	22.0	22.0	22.0	22.0	22.0
Stack Mass Flow (klbs/hr)	5,601.125	5,007.8	4,559.7	5,092.4	5,092.4
Stack Mass Flow (scfm)	1,267,039	1,136,313	1,040,928	1,156,663	1,156,663
Stack Mass Flow (dscfm)	1,149,838	1,022,227	920,805	1,038,105	1,038,105
Stack Temperature (**Exit**)(deg F)	196	191	195	192	199
Exhaust Flow per CT/HRSG (acfm)	1,606,689	1,430,808	1,318,959	1,458,894	1,474,557
Exit Velocity (ft/s)	70.4	62.7	57.8	64.0	64.7

Notes:
(a) Mitsubishi heat input increased by 5% by AECOM to be consistent with flue gas flow

Table B-2 Mitsubishi M501 GAC Detailed Operating and Emissions Calculations

	Combined-Cycle: No Duct Burner Firing										
Operating Case Number	1	2	3	4	5	6	7	8	9	10	11
CT LOAD/DB Load	100/0	75/0	60/0	100/0	75/0	60/0	100/0	75/0	60/0	100/0	100/0
Inlet Chilling	Off	Off	Off	Off	Off	Off	Off	Off	Off	On	On
Ambient Temperature (°F)	59	59	59	0	0	0	100	100	100	59	100
Relative Humidity	60	60	60	90	90	90	40	40	40	60	40
Atmospheric Pressure	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4
Estimated Performance											
Gas Turbine Load (%)	100	75	60	100	75	60	100	75	60	100	100
Fuel Type	GAS	GAS	GAS	GAS	GAS	GAS	GAS	GAS	GAS	GAS	GAS
Fuel LHV (Btu/lb)	20,377	20,377	20,377	20,377	20,377	20,377	20,377	20,377	20,377	20,377	20,377
Fuel HHV (Btu/lb)	22,589	22,589	22,589	22,589	22,589	22,589	22,589	22,589	22,589	22,589	22,589
Gas Turbine Power Output (kW)	255,500	191,600	153,300	299,600	224,700	179,700	221,700	166,300	133,000	263,100	263,100
Gas Turbine Heat Input (MMBtu/hr LHV)[a]	*2,353*	*1,851*	*1,597*	*2,702*	*2,076*	*1,774*	*2,111*	*1,690*	*1,468*	*2,409*	*2,409*
Gas Turbine Heat Input (MMBtu/hr **HHV**)	2,608	2,052	1,770	2,996	2,302	1,966	2,341	1,874	1,627	2,670	2,670
Gas Turbine Exhaust Mass Flow (klbs/hr)	4,985	4,170	3,526	5,579	4,538	3,799	4,537	3,839	3,307	5,070	5,070
Gas Turbine Exhaust Temperature (deg F)	1,127	1,120	1,182	1,102	1,086	1,145	1,156	1,153	1,202	1,123	1,123
Duct Burner Heat Input (MMBtu/hr HHV)	-	-	-	-	-	-	-	-	-	-	-
Duct Burner Fuel Flow (klbs/hr)	-	-	-	-	-	-	-	-	-	-	-
Total Heat Input (MMBtu/hr HHV)	2,608	2,052	1,770	2,996	2,302	1,966	2,341	1,874	1,627	2,670	2,670
Gas turbine exhaust analysis, % Vol.											
Argon	0.93	0.93	0.93	0.94	0.94	0.94	0.92	0.92	0.92	0.93	0.93
Nitrogen	74.24	74.37	74.32	74.84	74.95	74.92	73.09	73.21	73.22	74.07	74.07
Oxygen	12.17	12.53	12.42	12.10	12.45	12.33	12.01	12.39	12.38	12.07	12.07
CO2	4.01	3.84	3.90	4.13	3.96	4.02	3.93	3.75	3.76	4.03	4.03
Water	8.65	8.33	8.43	8.00	7.70	7.79	10.04	9.72	9.72	8.89	8.89
Molecular weight	28.39	28.41	28.40	28.47	28.49	28.48	28.22	28.24	28.25	28.36	28.36
O2 % dry basis	13.32	13.67	13.56	13.15	13.49	13.37	13.35	13.72	13.71	13.25	13.25
Gas turbine emissions before control											
NO_X ppmvd @ 15% O2	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
NO_X lb/MMBtu	0.0543	0.0543	0.0543	0.0543	0.0543	0.0543	0.0543	0.0543	0.0543	0.0543	0.0543
NO_X lb/hr (as NO2)	141.7	111.5	96.2	162.7	125.0	106.8	127.1	101.8	88.4	145.1	145.1
CO ppmvd @ 15% O2	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
CO lb/MMBtu	0.0220	0.0220	0.0220	0.0220	0.0220	0.0220	0.0220	0.0220	0.0220	0.0220	0.0220
CO lb/hr	57.5	45.2	39.0	66.0	50.7	43.3	51.6	41.3	35.9	58.9	58.9
VOC ppmvd @15% O2	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
VOC lb/MMBtu	0.0013	0.0013	0.0013	0.0013	0.0013	0.0013	0.0013	0.0013	0.0013	0.0013	0.0013
VOC lb/hr (as CH4)	3.29	2.58	2.23	3.77	2.90	2.48	2.95	2.36	2.05	3.36	3.36
$PM_{10}/PM_{2.5}$ lb/MMBtu HHV	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050
$PM_{10}/PM_{2.5}$ lb/hr (front and back)	13.04	10.26	8.85	14.98	11.51	9.83	11.70	9.37	8.14	13.35	13.35
Sulfur content of gas, grains/100 scf	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
SO_2, lb/MMBtu (HHV)	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04
SO_2, lb/hr	0.73	0.57	0.50	0.84	0.64	0.55	0.65	0.52	0.46	0.75	0.75
Percent S to H_2SO_4	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
H_2SO_4 lb/MMBtu (HHV)	3.43E-05	3.43E-05	3.43E-05	3.43E-05	3.43E-05	3.43E-05	3.43E-05	3.43E-05	3.43E-05	3.43E-05	3.43E-05
H_2SO_4 lb/hr	0.089	0.070	0.061	0.103	0.079	0.067	0.080	0.064	0.056	0.092	0.092

Table B-2 Mitsubishi M501 GAC Detailed Operating and Emissions Calculations

	Combined-Cycle: No Duct Burner Firing										
Operating Case Number	1	2	3	4	5	6	7	8	9	10	11
CT LOAD/DB Load	100/0	75/0	60/0	100/0	75/0	60/0	100/0	75/0	60/0	100/0	100/0
Inlet Chilling	Off	Off	Off	Off	Off	Off	Off	Off	Off	On	On
Ambient Temperature (°F)	59	59	59	0	0	0	100	100	100	59	100
Relative Humidity	60	60	60	90	90	90	40	40	40	60	40
Atmospheric Pressure	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4
Duct burner emissions before control											
NO_X lb/MMBtu (as NO_2)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
NO_X lb/hr (as NO2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CO lb/MMBtu	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
CO lb/hr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VOC lb/MMBtu	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010
VOC lb/hr (as CH4)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
$PM_{10}/PM_{2.5}$ lb/MMBtu HHV	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010
$PM_{10}/PM_{2.5}$ lb/hr (front and back)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SO_2, lb/MMBtu (HHV)	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04
SO_2, lb/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Percent S to H_2SO_4	*8.0*	*8.0*	*8.0*	*8.0*	*8.0*	*8.0*	*8.0*	*8.0*	*8.0*	*8.0*	*8.0*
H_2SO_4 lb/MMBtu (HHV)	3.43E-05	3.43E-05	3.43E-05	3.43E-05	3.43E-05	3.43E-05	3.43E-05	3.43E-05	3.43E-05	3.43E-05	3.43E-05
H_2SO_4 lb/hr	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Post duct burner exhaust analysis, % Vol.											
Argon	0.93	0.93	0.93	0.94	0.94	0.94	0.92	0.92	0.92	0.93	0.93
Nitrogen	74.24	74.37	74.32	74.84	74.95	74.92	73.09	73.21	73.22	74.07	74.07
Oxygen	12.17	12.53	12.42	12.10	12.45	12.33	12.01	12.39	12.38	12.07	12.07
CO2	4.01	3.84	3.90	4.13	3.96	4.02	3.93	3.75	3.76	4.03	4.03
Water	8.65	8.33	8.43	8.00	7.70	7.79	10.04	9.72	9.72	8.89	8.89
Molecular weight	28.39	28.41	28.40	28.47	28.49	28.48	28.22	28.24	28.25	28.36	28.36
O2 % dry basis	13.32	13.67	13.56	13.15	13.49	13.37	13.35	13.72	13.71	13.25	13.25
Total Emissions before control											
NO_X ppmvd @ 15% O2	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
NO_X lb/MMBtu	0.0543	0.0543	0.0543	0.0543	0.0543	0.0543	0.0543	0.0543	0.0543	0.0543	0.0543
NO_X lb/hr (as NO2)	141.7	111.5	96.2	162.7	125.0	106.8	127.1	101.8	88.4	145.1	145.1
CO ppmvd @ 15% O2	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
CO lb/MMBtu	0.0220	0.0220	0.0220	0.0220	0.0220	0.0220	0.0220	0.0220	0.0220	0.0220	0.0220
CO lb/hr	57.5	45.2	39.0	66.0	50.7	43.3	51.6	41.3	35.9	58.9	58.9
VOC ppmvd @15% O2	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
VOC lb/MMBtu	0.0013	0.0013	0.0013	0.0013	0.0013	0.0013	0.0013	0.0013	0.0013	0.0013	0.0013
VOC lb/hr (as CH4)	3.29	2.58	2.23	3.77	2.90	2.48	2.95	2.36	2.05	3.36	3.36
$PM_{10}/PM_{2.5}$ lb/hr (front and back)	13.04	10.26	8.85	14.98	11.51	9.83	11.70	9.37	8.14	13.35	13.35
$PM_{10}/PM_{2.5}$ lb/MMBtu HHV	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050
SO_2, lb/MMBtu (HHV)	0.00028	0.00028	0.00028	0.00028	0.00028	0.00028	0.00028	0.00028	0.00028	0.00028	0.00028
SO_2, lb/hr	0.73	0.57	0.50	0.84	0.64	0.55	0.65	0.52	0.46	0.75	0.75
H_2SO_4 lb/MMBtu (HHV)	3.43E-05	3.43E-05	3.43E-05	3.43E-05	3.43E-05	3.43E-05	3.43E-05	3.43E-05	3.43E-05	3.43E-05	3.43E-05
H_2SO_4 lb/hr	0.089	0.070	0.061	0.103	0.079	0.067	0.080	0.064	0.056	0.092	0.092

Table B-2 Mitsubishi M501 GAC Detailed Operating and Emissions Calculations

	Combined-Cycle: No Duct Burner Firing										
Operating Case Number	1	2	3	4	5	6	7	8	9	10	11
CT LOAD/DB Load	100/0	75/0	60/0	100/0	75/0	60/0	100/0	75/0	60/0	100/0	100/0
Inlet Chilling	Off	Off	Off	Off	Off	Off	Off	Off	Off	On	On
Ambient Temperature (°F)	59	59	59	0	0	0	100	100	100	59	100
Relative Humidity	60	60	60	90	90	90	40	40	40	60	40
Atmospheric Pressure	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4
Total Emissions after control											
NO_X ppmvd @ 15% O2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
NOx lb/MMBtu	0.00724	0.00724	0.00724	0.00724	0.00724	0.00724	0.00724	0.00724	0.00724	0.00724	0.00724
NO_X lb/hr (as NO2)	18.89	14.86	12.82	21.70	16.67	14.24	16.95	13.57	11.78	19.34	19.34
CO Emission Reduction - % Decrease	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0
CO ppmvd @ 15% O2	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
CO lb/MMBtu	0.0033	0.0033	0.0033	0.0033	0.0033	0.0033	0.0033	0.0033	0.0033	0.0033	0.0033
CO lb/hr	8.62	6.78	5.85	9.91	7.61	6.50	7.74	6.20	5.38	8.83	8.83
VOC Emission Reduction - % Decrease	*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*
VOC ppmvd @ 15% O2	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
VOC lb/MMBtu	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009
VOC lb/hr (as CH4)	2.30	1.81	1.56	2.64	2.03	1.73	2.06	1.65	1.43	2.35	2.35
Potential conversion of H_2SO_4 to ammonium sulfate	100	100	100	100	100	100	100	100	100	100	100
Increase in $PM_{10}/PM_{2.5}$ emissions from inlet H_2SO_4	0.12	0.09	0.08	0.14	0.11	0.09	0.11	0.09	0.08	0.12	0.12
Increase in $PM_{10}/PM_{2.5}$ emissions from H_2SO_4 conversion by controls	0.35	0.27	0.23	0.40	0.31	0.26	0.31	0.25	0.22	0.35	0.35
$PM_{10}/PM_{2.5}$ lb/MMBtu HHV	0.0052	0.0052	0.0052	0.0052	0.0052	0.0052	0.0052	0.0052	0.0052	0.0052	0.0052
$PM_{10}/PM_{2.5}$ lb/hr (front and back)	13.51	10.63	9.17	15.51	11.92	10.18	12.12	9.70	8.43	13.83	13.83
SO_2, lb/MMBtu (HHV)	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04
SO_2 lb/hr	0.73	0.57	0.50	0.84	0.64	0.55	0.65	0.52	0.46	0.75	0.75
Percent S to H2SO4 by controls	25	25	25	25	25	25	25	25	25	25	25
H2SO4 formed by controls (lb/hr)	0.26	0.20	0.17	0.30	0.23	0.19	0.23	0.18	0.16	0.26	0.26
H2SO4 lb/MMBtu (HHV)	1.33E-04	1.33E-04	1.33E-04	1.33E-04	1.33E-04	1.33E-04	1.33E-04	1.33E-04	1.33E-04	1.33E-04	1.33E-04
H2SO4 lb/hr	0.35	0.27	0.24	0.40	0.31	0.26	0.31	0.25	0.22	0.35	0.35
NH3 Consumption (klbs/hr)	0.3324	0.2661	0.2281	0.382	0.298	0.2532	0.2985	0.2407	0.2077	0.3408	0.3408
NH3 ppmvd @ 15% O2	*5.0*	*5.0*	*5.0*	*5.0*	*5.0*	*5.0*	*5.0*	*5.0*	*5.0*	*5.0*	*5.0*
NH3 lb/MMBtu (HHV)	0.0067	0.0067	0.0067	0.0067	0.0067	0.0067	0.0067	0.0067	0.0067	0.0067	0.0067
NH3 lb/hr	17.5	13.7	11.8	20.0	15.4	13.2	15.7	12.5	10.9	17.9	17.9
Stack data											
Total Heat Input (MMBtu/hr HHV)	2,608	2,052	1,770	2,996	2,302	1,966	2,341	1,874	1,627	2,670	2,670
Stack Diameter, ft	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
Stack Mass Flow (klbs/hr)	4,985.5	4,170.5	3,526.3	5,578.9	4,537.8	3,799.4	4,537.5	3,838.8	3,307.1	5,070.1	5,070.1
Stack Mass Flow (scfm)	1,127,967	942,924	797,422	1,258,426	1,023,088	856,725	1,032,498	872,953	751,930	1,148,225	1,148,225
Stack Mass Flow (dscfm)	1,030,398	864,378	730,199	1,157,752	944,310	789,986	928,835	788,102	678,842	1,046,148	1,046,148
Stack Temperature (**Exit**)(deg F)	198	192	185	202	195	187	200	193	186	198	205
Exhaust Flow per CT/HRSG (acfm)	1,434,483	1,187,847	994,523	1,611,105	1,294,968	1,072,130	1,316,866	1,102,065	938,805	1,461,802	1,476,684
Exit Velocity (ft/s)	62.9	52.1	43.6	70.6	56.8	47.0	57.7	48.3	41.2	64.1	64.7

Table B-3 Annual Emissions with Startups and Shutdowns - Mitsubishi M501GAC

Start-up, Shutdown and Offline Events / Hours (Each Turbine)

Operating Mode	Number	Duration (SU/SD)		Offline		NO_x	CO	VOC	PM10/PM2.5	SO2
	of Events/yr	hr/event	hr/yr	hr/event	hr/yr	lb/stack	lb/stack	lb/stack	lb/stack	lb/stack
Hot start	174.0	0.72	125	4	696	60.10	475.50	495.90	4.10	0.23
Warm start	15.0	1.68	25	40	600	77.00	804.20	1,495.80	8.90	0.49
Cold start	6.0	4.20	25	72	432	115.10	2,205.30	3,587.80	23.30	1.28
Shutdown	195.0	0.23	46	n/a	n/a	23.80	142.90	135.90	1.30	0.07
TOTALS			**221**		**1,728**					

NOx, CO, VOC, PM10/PM2.5, and SO2 lb/stack emission rates are based on information from the vendor.

Annual NO_x Emissions with Start-up and Shutdown (One Turbine)

Operating Mode	hr/yr	NOx		CO		VOC		PM10/PM2.5		SO2	
		lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Offline	1,728	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Without duct burning	811	21.70	8.80	9.91	4.02	2.64	1.07	15.51	6.29	0.84	0.340
With duct burning	6,000	25.32	75.95	17.41	52.22	6.14	18.42	21.16	63.48	0.98	2.935
Hot start	125	83.86	5.23	663.49	41.37	691.95	43.14	5.72	0.36	0.32	0.020
Warm start	25	45.74	0.58	477.74	6.03	888.59	11.22	5.29	0.07	0.29	0.004
Cold start	25	27.40	0.35	525.07	6.62	854.24	10.76	5.55	0.07	0.30	0.004
Shutdown	46	102.00	2.32	612.43	13.93	582.43	13.25	5.57	0.13	0.30	0.007
TOTALS	**8,760**		**93.23**		**124.18**		**97.87**		**70.40**		**3.31**

Table B-4 Maximum Annual Emissions with Startups and Shutdowns - Mitsubishi M501 GAC

Operating Parameters - Each Unit

			Potential Emission Rates (Per Turbine)				3x3x1 Configuration
Parameter	**Combustion Turbine w/ Duct Firing**	**Combustion Turbine w/out Duct Firing**	**Annual Emissions based on DB Firing & CT Only Operating Hour Limits**	**Annual Emissions Based on CT Only Year-Round**	**Annual Emissions with Startup and Shutdown**	**Worst-Case Annual Emissions**	**Worst-Case Annual Emissions (Total)**
Operating Hours	6,000 hr/yr	2,760 hr/yr					
NOx:	25.32 lb/hr	21.70 lb/hr	105.90 ton/yr	95.03 ton/yr	93.23 ton/yr	105.90 ton/yr	317.69 ton/yr
CO:	17.41 lb/hr	9.91 lb/hr	65.88 ton/yr	43.38 ton/yr	124.18 ton/yr	124.18 ton/yr	372.55 ton/yr
VOC:	6.14 lb/hr	2.64 lb/hr	22.07 ton/yr	11.57 ton/yr	97.87 ton/yr	97.87 ton/yr	293.61 ton/yr
PM10/PM2.5:	21.16 lb/hr	15.51 lb/hr	84.89 ton/yr	67.95 ton/yr	70.40 ton/yr	84.89 ton/yr	254.67 ton/yr
SO2:	0.98 lb/hr	0.84 lb/hr	4.09 ton/yr	3.67 ton/yr	3.31 ton/yr	4.09 ton/yr	12.27 ton/yr
H2SO4:	0.88 lb/hr	0.40 lb/hr	3.18 ton/yr	1.74 ton/yr	<3.18 ton/yr	3.18 ton/yr	9.55 ton/yr
NH3:	23.39 lb/hr	20.05 lb/hr	97.84 ton/yr	87.80 ton/yr	<97.84 ton/yr	97.84 ton/yr	293.52 ton/yr
Lead:	0.0017 lb/hr	0.0015 lb/hr	0.007 ton/yr	0.006 ton/yr	<0.007 ton/yr	0.007 ton/yr	0.022 ton/yr

Notes:

Duct burner capacity estimated at 500 MMBtu/hr (at 100% load).

Hourly emission estimates are based on worst-case ambient conditions (i.e., temperature, % relative humidity) at normal operations.

For lead, emission rates for natural gas firing are based on the worst-case firing rate, a heat content value of 1020 Btu/scf and the AP-42 emission factor of 0.0005 lb/MMcf.

For "Annual emissions with DB Firing at Operating Hour Limit", emission estimates were calculated as follows:

Annual Emissions (ton/yr) = [Pollutant Emission Rate, CT w/DB (lb/hr) x Operating Hours, CT w/DB (hr/yr) + Pollutant Emission Rate, CT only (lb/hr) x Operating Hours, CT only (hr/yr)] / (2000 lb / ton)

For "annual emissions with no DB firing", emission estimates for the natural gas firing (CT only) were based on 8,760 operating hours per year.

Table B-5 Hazardous Air Pollutant Emissions - Mitsubishi M501GAC

Combustion Turbines

Number:	3		Natural Gas Heating Value:	1,020	Btu/scf (HHV)
Maximum Heat Input - CT	2,996	MMBtu/hr (HHV)			
Maximum Heat Input - Duct Burner	500	MMBtu/hr (HHV)			
Operating Hours with Duct Burner	6,000	hr/yr	**VOHAP Efficiency:**	**30%**	**reduction**
Operating Hours - No Duct Burner	2,760	hr/yr			

Auxiliary Boilers			**Fuel Gas Heaters**			**Emergency Firewater Pump**			**Emergency Generator**		
Number:	1		Number:	1		Number:	1		Number:	1	
Maximum Heat Input	88.1	MMBtu/hr	Maximum Heat Input	52.0	MMBtu/hr	Maximum Heat Input	2.3	MMBtu/hr	Maximum Heat Input	16.9	MMBtu/hr
Operating Hours	8,760	hr/yr	Operating Hours	8,760	hr/yr	Operating Hours	500	hr/yr	Operating Hours	500	hr/yr

					Combstion Turbine		Auxiliary Boiler		Fuel Gas Heater		Emergency Firewater		Emergency Generator		Total - New Sources	
Pollutant	**Emission Factor**	**Emission Factor**		**Emission Factor**	**Emission Factor**	**Emission Rate, 1 Turbine**		**Emission Rate, 1 Boiler**		**Emission Rate, 1 Boiler**		**Emission Rate, 1 Firewater Pump**		**Emission Rate, 1 Generator**		**Emission Rate, Total**	
	AP-42 Section 3.1 04/00 - Combustion Turbine Natural Gas	**AP-42 Section 1.4 07/98 - Boilers - Natural Gas Combustion**		**AP-42 Section 3.3 04/00 - Gasoline and Diesel Industrial Engines (upto 600 HP)**	**AP-42 Section 3.4 04/00 - Large Stationary Diesel Engines (> 600 HP)**	**Maximum Hourly[b]**	**Annual[c]**	**Maximum Hourly[d]**	**Annual[e]**	**Maximum Hourly[d]**	**Annual[e]**	**Maximum Hourly[d]**	**Annual[e]**	**Maximum Hourly[d]**	**Annual[e]**	**Maximum Hourly**	**Annual**
	(lb/MMBtu)[a]	**(lb/10^{6}scf)**	**(lb/MMBtu)[a]**	**(lb/MMBtu)**	**(lb/MMBtu)**	**(lb/hr)**	**(tpy)**	**(lb/hr)**	**(tpy)**	**(lb/hr)**	**(tpy)**	**(lb/hr)**	**(tpy)**	**(lb/hr)**	**(tpy)**	**(lb/hr)**	**(tpy)**
1,3-Butadiene	4.30E-07			3.91E-05		9.02E-04	3.95E-03					8.99E-05	2.25E-05			2.79E-03	1.19E-02
2-Methylnaphthalene		2.40E-05	2.35E-08			8.24E-06	2.47E-05	2.07E-06	9.08E-06	1.22E-06	5.36E-06					2.80E-05	8.86E-05
3-Methylchloranthrene		1.80E-06	1.76E-09			6.18E-07	1.85E-06	1.55E-07	6.81E-07	9.18E-08	4.02E-07					2.10E-06	6.64E-06
7,12-Dimethylbenz(a)anthracene		1.60E-05	1.57E-08			5.49E-06	1.65E-05	1.38E-06	6.05E-06	8.16E-07	3.57E-06					1.87E-05	5.90E-05
Acenaphthene		1.80E-06	1.76E-09	1.42E-06	4.68E-06	6.18E-07	1.85E-06	1.55E-07	6.81E-07	9.18E-08	4.02E-07	3.26E-06	8.16E-07	7.91E-05	1.98E-05	8.45E-05	2.72E-05
Acenaphthylene		1.80E-06	1.76E-09	5.06E-06	9.23E-06	6.18E-07	1.85E-06	1.55E-07	6.81E-07	9.18E-08	4.02E-07	1.16E-05	2.91E-06	1.56E-04	3.90E-05	1.70E-04	4.86E-05
Acetaldehyde	4.00E-05			7.67E-04	2.52E-05	8.39E-02	3.67E-01					1.76E-03	4.41E-04	4.26E-04	1.07E-04	2.54E-01	1.10E+00
Acrolein	6.40E-06			9.25E-05	7.88E-06	1.34E-02	5.88E-02					2.13E-04	5.31E-05	1.33E-04	3.33E-05	4.06E-02	1.76E-01
Anthracene		2.40E-06	2.35E-09	1.87E-06	1.23E-06	8.24E-07	2.47E-06	2.07E-07	9.08E-07	1.22E-07	5.36E-07	4.30E-06	1.07E-06	2.08E-05	5.20E-06	2.79E-05	1.51E-05
Benz(a)anthracene		1.80E-06	1.76E-09	1.68E-06	6.22E-07	6.18E-07	1.85E-06	1.55E-07	6.81E-07	9.18E-08	4.02E-07	3.86E-06	9.65E-07	1.05E-05	2.63E-06	1.65E-05	1.02E-05
Benzene	1.20E-05	2.10E-03	2.06E-06	9.33E-04	7.76E-04	2.59E-02	1.12E-01	1.81E-04	7.94E-04	1.07E-04	4.69E-04	2.14E-03	5.36E-04	1.31E-02	3.28E-03	9.32E-02	3.42E-01
Benzo(a)pyrene		1.20E-06	1.18E-09	1.88E-07	2.57E-07	4.12E-07	1.24E-06	1.04E-07	4.54E-07	6.12E-08	2.68E-07	4.32E-07	1.08E-07	4.34E-06	1.09E-06	6.18E-06	5.62E-06
Benzo(b)flouoranthene		1.80E-06	1.76E-09	9.91E-08	1.11E-06	6.18E-07	1.85E-06	1.55E-07	6.81E-07	9.18E-08	4.02E-07	2.28E-07	5.69E-08	1.88E-05	4.69E-06	2.11E-05	1.14E-05
Benzo(g,h,I)perylene		1.20E-06	1.18E-09		5.56E-07	4.12E-07	1.24E-06	1.04E-07	4.54E-07	6.12E-08	2.68E-07			9.40E-06	2.35E-06	1.08E-05	6.78E-06
Benzo(k)fluoranthene		1.80E-06	1.76E-09	1.55E-07	2.18E-07	6.18E-07	1.85E-06	1.55E-07	6.81E-07	9.18E-08	4.02E-07	3.56E-07	8.91E-08	3.69E-06	9.21E-07	6.14E-06	7.65E-06
Chrysene		1.80E-06	1.76E-09	3.53E-07	1.53E-06	6.18E-07	1.85E-06	1.55E-07	6.81E-07	9.18E-08	4.02E-07	8.11E-07	2.03E-07	2.59E-05	6.47E-06	2.88E-05	1.33E-05
Dibenzo(a,h)anthracene		1.20E-06	1.18E-09	5.83E-07	3.46E-07	4.12E-07	1.24E-06	1.04E-07	4.54E-07	6.12E-08	2.68E-07	1.34E-06	3.35E-07	5.85E-06	1.46E-06	8.59E-06	6.23E-06
Dichlorobenzene		1.20E-03	1.18E-06			4.12E-04	1.24E-03	1.04E-04	4.54E-04	6.12E-05	2.68E-04					1.40E-03	4.43E-03
Ethylbenzene	3.20E-05					6.71E-02	2.94E-01									2.01E-01	8.82E-01
Fluoranthene		3.00E-06	2.94E-09	7.61E-06	4.03E-06	1.03E-06	3.09E-06	2.59E-07	1.13E-06	1.53E-07	6.70E-07	1.75E-05	4.37E-06	6.81E-05	1.70E-05	8.91E-05	3.25E-05
Fluorene		2.80E-06	2.75E-09	2.92E-05	1.28E-05	9.61E-07	2.88E-06	2.42E-07	1.06E-06	1.43E-07	6.25E-07	6.71E-05	1.68E-05	2.16E-04	5.41E-05	2.87E-04	8.12E-05
Formaldehyde (g)	2.20E-04	7.50E-02	7.35E-05	1.18E-03	7.89E-05	4.87E-01	2.10E+00	6.48E-03	2.84E-02	3.82E-03	1.67E-02	2.71E-03	6.78E-04	1.33E-03	3.33E-04	1.48E+00	6.34E+00
Hexane		1.80E+00	1.76E-03			6.18E-01	1.85E+00	1.55E-01	6.81E-01	9.18E-02	4.02E-01					2.10E+00	6.64E+00
Indeno(1,2,3-cd)pyrene		1.80E-06	1.76E-09	3.75E-07	4.14E-07	6.18E-07	1.85E-06	1.55E-07	6.81E-07	9.18E-08	4.02E-07	8.62E-07	2.15E-07	7.00E-06	1.75E-06	9.96E-06	8.61E-06
Naphthalene	1.30E-06	6.10E-04	5.98E-07	8.48E-05	1.3E-04	2.94E-03	1.26E-02	5.27E-05	2.31E-04	3.11E-05	1.36E-04	1.95E-04	4.87E-05	2.20E-03	5.49E-04	1.13E-02	3.87E-02
PAHs	2.20E-06					4.61E-03	2.02E-02									1.38E-02	6.06E-02
Phenanathrene		1.70E-05	1.67E-08	2.94E-05	4.08E-05	5.83E-06	1.75E-05	1.47E-06	6.43E-06	8.67E-07	3.80E-06	6.76E-05	1.69E-05	6.90E-04	1.72E-04	7.77E-04	2.52E-04
Propylene Oxide	2.90E-05					6.08E-02	2.66E-01									1.82E-01	7.99E-01
Pyrene		5.00E-06	4.90E-09	4.78E-06	3.71E-06	1.72E-06	5.15E-06	4.32E-07	1.89E-06	2.55E-07	1.12E-06	1.10E-05	2.75E-06	6.27E-05	1.57E-05	7.95E-05	3.69E-05
Toluene	1.30E-04	3.40E-03	3.33E-06	4.09E-04	2.81E-04	2.74E-01	1.20E+00	2.94E-04	1.29E-03	1.73E-04	7.59E-04	9.40E-04	2.35E-04	4.75E-03	1.19E-03	8.27E-01	3.60E+00
Xylene	6.40E-05			2.85E-04	1.93E-04	1.34E-01	5.88E-01					6.55E-04	1.64E-04	3.26E-03	8.16E-04	4.07E-01	1.76E+00

Table B-5 Hazardous Air Pollutant Emissions - Mitsubishi M501GAC

Combustion Turbines

Number:	3		Natural Gas Heating Value:	1,020	Btu/scf (HHV)
Maximum Heat Input - CT	2,996	MMBtu/hr (HHV)			
Maximum Heat Input - Duct Burner	500	MMBtu/hr (HHV)			
Operating Hours with Duct Burner	6,000	hr/yr	**VOHAP Efficiency:**	**30%**	**reduction**
Operating Hours - No Duct Burner	2,760	hr/yr			

Auxiliary Boilers			**Fuel Gas Heaters**			**Emergency Firewater Pump**			**Emergency Generator**		
Number:	1		Number:	1		Number:	1		Number:	1	
Maximum Heat Input	88.1	MMBtu/hr	Maximum Heat Input	52.0	MMBtu/hr	Maximum Heat Input	2.3	MMBtu/hr	Maximum Heat Input	16.9	MMBtu/hr
Operating Hours	8,760	hr/yr	Operating Hours	8,760	hr/yr	Operating Hours	500	hr/yr	Operating Hours	500	hr/yr

							Combstion Turbine		Auxiliary Boiler		Fuel Gas Heater		Emergency Firewater		Emergency Generator		Total - New Sources	
							Emission Rate, 1 Turbine		Emission Rate, 1 Boiler		Emission Rate, 1 Boiler		Emission Rate, 1 Firewater Pump		Emission Rate, 1 Generator		Emission Rate, Total	
Pollutant	**Emission Factor**	**Emission Factor**		**Emission Factor**	**Emission Factor**													
	AP-42 Section 3.1 04/00 - Combustion Turbine Natural Gas	**AP-42 Section 1.4 07/98 - Boilers - Natural Gas Combustion**		**AP-42 Section 3.3 04/00 - Gasoline and Diesel Industrial Engines (upto 600 HP)**	**AP-42 Section 3.4 04/00 - Large Stationary Diesel Engines (> 600 HP)**		**Maximum Hourly[b]**	**Annual[c]**	**Maximum Hourly[d]**	**Annual[e]**	**Maximum Hourly[d]**	**Annual[e]**	**Maximum Hourly[d]**	**Annual[e]**	**Maximum Hourly[d]**	**Annual[e]**	**Maximum Hourly**	**Annual**
	(lb/MMBtu)[a]	**(lb/10^{6}scf)**	**(lb/MMBtu)[a]**	**(lb/MMBtu)**	**(lb/MMBtu)**		**(lb/hr)**	**(tpy)**	**(lb/hr)**	**(tpy)**	**(lb/hr)**	**(tpy)**	**(lb/hr)**	**(tpy)**	**(lb/hr)**	**(tpy)**	**(lb/hr)**	**(tpy)**
Arsenic [f]		2.00E-04	1.96E-07				6.85E-04	2.94E-04	1.73E-05	7.56E-05	1.02E-05	4.47E-05					2.08E-03	1.00E-03
Beryllium [f]		1.20E-05	1.18E-08				4.11E-05	1.76E-05	1.04E-06	4.54E-06	6.12E-07	2.68E-06					1.25E-04	6.02E-05
Cadmium [f]		1.10E-03	1.08E-06				3.77E-03	1.62E-03	9.50E-05	4.16E-04	5.61E-05	2.46E-04					1.15E-02	5.51E-03
Chromium [f]		1.40E-03	1.37E-06				4.80E-03	2.06E-03	1.21E-04	5.30E-04	7.14E-05	3.13E-04					1.46E-02	7.02E-03
Cobalt [f]		8.40E-05	8.24E-08				2.88E-04	1.24E-04	7.25E-06	3.18E-05	4.28E-06	1.88E-05					8.75E-04	4.21E-04
Lead [f]		5.00E-04	4.90E-07				1.71E-03	7.35E-04	4.32E-05	1.89E-04	2.55E-05	1.12E-04					5.21E-03	2.51E-03
Manganese [f]		3.80E-04	3.73E-07				1.30E-03	5.59E-04	3.28E-05	1.44E-04	1.94E-05	8.49E-05					3.96E-03	1.91E-03
Mercury [f]		2.60E-04	2.55E-07				8.91E-04	3.82E-04	2.25E-05	9.83E-05	1.33E-05	5.81E-05					2.71E-03	1.30E-03
Nickel [f]		2.10E-03	2.06E-06				7.20E-03	3.09E-03	1.81E-04	7.94E-04	1.07E-04	4.69E-04					2.19E-02	1.05E-02
Selenium [f]		2.40E-05	2.35E-08				8.22E-05	3.53E-05	2.07E-06	9.08E-06	1.22E-06	5.36E-06					2.50E-04	1.20E-04
																Total HAPS (tpy)		**21.8**
																Max Single HAP (tpy)		**6.6**

Notes:

(a) Emission Factor (lb/MMBtu) = (Emission Factor, lb/10^6 scf) / (Volumetric Heat Content, Btu/scf)
(b) For Turbines, Hourly Emission Rate (lb/hr) = [Max Heat Input - CT (MMBtu/hr) * Emission Factor - CT (lb/MMBtu) + Max Heat Input - DB (MMBtu/hr) * Emission Factor - non-CT (lb/MMBtu)]
(c) For Turbines, Annual Emission Rate (tpy) = [Max Heat Input - CT (MMBtu/Hr) * 8760 hr/yr * Emission Factor - CT (lb/MMBtu) + Max Heat Input - DB (MMBtu/Hr) * Operating Hours - DB (hr/yr) * Emission Factor - non-CT (lb/MMBtu)] / (2,000 lb/ton)
(d) For Boiler/Heaters/Engines, Hourly Emission Rate (lb/hr) = Max Heat Input (MMBtu/Hr) * Emission Factor - non-CT (lb/MMBtu)
(e) For Boilers/ Heaters/ Engines, Annual Emission Rate (ton/yr) = Max Heat Input (MMBtu/hr) * Emission Factor (lb/MMBtu) * Annual Operation (hr/yr) / 2000 (lb/ton)
(f) Combustion turbine emissions of metallic HAPs calculated using non-CT natural gas combustion emission factors.
(g) 91 ppbvd at 15% O2 based on information provided by Mitsubishi for dry lox NOx combustion.

Table B-5-1 Hazardous Air Pollutant Air Toxics Analysis- Mitsubishi M501GAC

Pollutant	Total - New Sources (Table B-5) Emission Rate, Total		Virginia Air Toxics Exemption Levels		Exempt? (hourly)	Exempt? (annual)	SAAC (ug/m3)	
	Maximum Hourly (lb/hr)	Annual (tpy)	Maximum Hourly (lb/hr)	Annual (tpy)	Yes/No	Yes/No	Hourly	Annual
1,3-Butadiene	2.79E-03	1.19E-02	1.452	3.19	Yes	Yes		
2-Methylnaphthalene	2.80E-05	8.86E-05	*	*	Yes	Yes		
3-Methylchloranthrene	2.10E-06	6.64E-06	*	*	Yes	Yes		
7,12-Dimethylbenz(a)anthracene	1.87E-05	5.90E-05	*	*	Yes	Yes		
Acenaphthene	8.45E-05	2.72E-05	*	*	Yes	Yes		
Acenaphthylene	1.70E-04	4.86E-05	*	*	Yes	Yes		
Acetaldehyde	2.54E-01	1.10E+00	8.91	26.1	Yes	Yes		
Acrolein	4.06E-02	1.76E-01	0.02277	0.03335	No	No	17.25	0.46
Anthracene	2.79E-05	1.51E-05	*	*	Yes	Yes		
Benz(a)anthracene	1.65E-05	1.02E-05	*	*	Yes	Yes		
Benzene	9.32E-02	3.42E-01	2.112	4.64	Yes	Yes		
Benzo(a)pyrene	6.18E-06	5.62E-06	*	*	Yes	Yes		
Benzo(b)flouoranthene	2.11E-05	1.14E-05	*	*	Yes	Yes		
Benzo(g,h,I)perylene	1.08E-05	6.78E-06	*	*	Yes	Yes		
Benzo(k)fluoranthene	6.14E-06	7.65E-06	*	*	Yes	Yes		
Chrysene	2.88E-05	1.33E-05	*	*	Yes	Yes		
Dibenzo(a,h)anthracene	8.59E-06	6.23E-06	*	*	Yes	Yes		
Dichlorobenzene	1.40E-03	4.43E-03	21.813	65.395	Yes	Yes		
Ethylbenzene	2.01E-01	8.82E-01	17.919	62.93	Yes	Yes		
Fluoranthene	8.91E-05	3.25E-05	*	*	Yes	Yes		
Fluorene	2.87E-04	8.12E-05	*	*	Yes	Yes		
Formaldehyde	1.48E+00	6.34E+00	0.0825	0.174	No	No	62.5	2.4
Hexane	2.10E+00	6.64E+00	11.616	25.52	Yes	Yes		
Indeno(1,2,3-cd)pyrene	9.96E-06	8.61E-06	*	*	Yes	Yes		
Naphthalene	1.13E-02	3.87E-02	2.607	7.54	Yes	Yes		
PAHs	1.38E-02	6.06E-02	*	*	Yes	Yes		
Phenanathrene	7.77E-04	2.52E-04	*	*	Yes	Yes		
Propylene Oxide	1.82E-01	7.99E-01	3.168	6.96	Yes	Yes		
Pyrene	7.95E-05	3.69E-05	*	*	Yes	Yes		
Toluene	8.27E-01	3.60E+00	18.645	54.665	Yes	Yes		
Xylene	4.07E-01	1.76E+00	21.483	62.93	Yes	Yes		
Arsenic	2.08E-03	1.00E-03	0.0132	0.029	Yes	Yes		
Beryllium	1.25E-04	6.02E-05	0.000132	0.00029	Yes	Yes		
Cadmium	1.15E-02	5.51E-03	0.0033	0.00725	No	Yes	2.5	
Chromium	1.46E-02	7.02E-03	0.0033	0.00725	No	Yes	2.5	
Cobalt	8.75E-04	4.21E-04	0.0033	0.00725	Yes	Yes		
Lead	5.21E-03	2.51E-03	0.0099	0.02175	Yes	Yes		
Manganese	3.96E-03	1.91E-03	0.33	0.725	Yes	Yes		
Mercury	2.71E-03	1.30E-03	0.0033	0.00725	Yes	Yes		
Nickel	2.19E-02	1.05E-02	0.0066	0.0145	No	Yes	5	
Selenium	2.50E-04	1.20E-04	0.0132	0.029	Yes	Yes		

Notes:

* indicates that the neither exemption levels or SAACs exist.

Table B-6 Auxiliary Boiler Emissions

Emission Source:	Auxiliary Boiler
Source Type:	Natural Gas-Fired Boiler
Heat Input (MMBtu/hr):	88.1
Maximum Fuel Usage (MMcf/hr)	0.0864
Number of Units:	1
Natural Gas Heating Value (Btu/scf)	1,020
Sulfur Content of Natural Gas (gr / 100 scf)	0.1
Operating Hours per Year: (e)	8,760

Compound	Emission Factor	Emission Rate - per Unit		Total Units
		Hourly (c)	Annual (d)	Annual (d)
	(lb/MMBtu)	(lb/hr)	(ton/year)	(ton/year)
Criteria Pollutants				
Nitrogen Oxides (a)	0.011	0.97	4.24	4.24
Carbon Monoxide (a)	0.037	3.26	14.27	14.27
VOC (a)	0.005	0.47	2.08	2.08
Sulfur Oxides (a)	2.80E-04	0.025	0.108	0.108
PM10/PM2.5 (a)	0.005	0.44	1.93	1.93
Lead (b)	4.9E-07	4.3E-05	1.9E-04	1.9E-04
H2SO4 (f)	2.14E-05	1.9E-03	8.3E-03	8.3E-03

Notes:
(a) Emission factors (lb/MMBtu) are based on the proposed BACT emission rates for natural gas-fired boilers.
(b) Emission factors (lb/MMBtu) are based on emission factors (lb/MMcf) referenced from AP-42, Section 1.4 dated July 1998 and a heat content value of 1020 Btu/scf.
(c) Hourly Emission Rate (lb/hr) = Heat Input (MMBtu/hr) * Emission Factor (lb/MMBtu)
(d) Annual Emission Rate (ton/yr) = Hourly Emission Rate (lb/hr) * Annual Operating Hours (hr/yr) / (2,000 lb/ton)
(e)Auxiliary boiler permitted to operate 8,760 hr/yr
(f) H2SO4 emissions based on a 5% conversion of SO2 to SO3.

Stack Parameters

Stack Height	115.0	ft
Stack Diameter	3.00	ft
Stack Exit Velocity	61	ft/sec
Exhaust Flow	25,744	acfm
Exhaust Temp	300	F

Table B-7 Fuel Gas Heater Emissions

Emission Source:	Gas Fired Heaters
Source Type:	Natural Gas-Fired Boiler
Heat Input (MMBtu/hr):	52.0
Maximum Fuel Usage (MMcf/hr)	0.0510
Number of Units:	1
Natural Gas Heating Value (Btu/scf)	1020
Sulfur Content of Natural Gas (gr / 100 scf)	0.1
Operating Hours per Year: (e)	8,760

Compound	Emission Factor	Emission Rate - per Unit		Total Units
		Hourly (c)	Annual (d)	Annual (d)
	(lb/MMBtu)	(lb/hr)	(ton/year)	(ton/year)
Criteria Pollutants				
Nitrogen Oxides (a)	0.011	0.57	2.51	2.51
Carbon Monoxide (a)	0.037	1.92	8.43	8.43
VOC (a)	0.005	0.28	1.23	1.23
Sulfur Oxides (b)	2.80E-04	0.01	0.06	0.06
PM10/PM2.5 (b)	0.007	0.39	1.70	1.70
Lead (b)	4.9E-07	2.5E-05	1.1E-04	1.1E-04
H2SO4 (f)	2.14E-05	1.1E-03	4.9E-03	4.9E-03

Notes:

(a) Emission factors (lb/MMBtu) are based on the proposed BACT emission rates for natural gas-fired heaters.

(b) Emission factors (lb/MMBtu) are based on emission factors (lb/MMcf) referenced from AP-42, Section 1.4 dated July 1998 and a heat content value of 1020 Btu/scf.

(c) Hourly Emission Rate (lb/hr) = Heat Input (MMBtu/hr) * Emission Factor (lb/MMBtu)

(d) Annual Emission Rate (ton/yr) = Hourly Emission Rate (lb/hr) * Annual Operating Hours (hr/yr) / (2,000 lb/ton)

(e) Heater permitted to operate 8,760 hr/yr

(f) H2SO4 emissions based on a 5% conversion of SO2 to SO3.

Stack Parameters

Stack Height	45.0	ft
Stack Diameter	3.33	ft
Stack Exit Velocity	32	ft/sec
Exhaust Flow	16,746	acfm
Exhaust Temp	300	F

Table B-8 Turbine Chiller Emissions

Water Circulation Rate (a) all cells	(GPM)	10,000
No. of Cells 6		
Total Liquid Drift (b)	(%)	0.0005
Expected TDS/TSS of Circulated Water (c)	(ppmw)	2,000
Weight Percent PM10 in Particulate Emissions (d)	(%)	71.81
Weight Percent PM2.5 in Particulate Emissions (d)	(%)	0.22
Emission Rate - Total Cooling Tower		
PM (e)	(lb/hr)	5.007E-02
	(ton/yr)	2.193E-01
PM-10	(lb/hr)	3.596E-02
	(ton/yr)	1.575E-01
PM-2.5	(lb/hr)	1.102E-04
	(ton/yr)	4.825E-04
Emission Rate - Per Cell (f)		
PM (e)	(lb/hr)	8.345E-03
	(ton/yr)	3.655E-02
PM-10	(lb/hr)	5.993E-03
	(ton/yr)	2.625E-02
PM-2.5	(lb/hr)	1.836E-05
	(ton/yr)	8.042E-05

Notes:

(a) Design Water Circulation Rate, Gallons/Minute (GPM)

(b) Design Total Liquid Drift, Percent (%)

(c) Process Design Data of 2,000 ppmw in circulating water

(d) Weight percentages of PM10 and PM2.5 provided by the vendor.

(e) Based on USEPA AP-42 Section 13.4 Wet Cooling Towers,
Table 13.4-1 dated 1/95. Modified to Cooling Tower Design
Emission Rate (lb/hr) = Water Circulation Rate (gpm) x 60 x Drift (%)
/ 100 x 8.3453 (lb/gal) x TDS (lb PM/1,000,000 lb water) x
Weight Percent of Particle Size (%) / 100
Emission Rate (ton/yr) = Emission Rate (lb/hr) x 8,760 hr/yr / 2,000 lb/to

(f) Emission rate per cell = Emission rate total / Number of Cells

Stack Parameters (Each Cooling Tower)

Number of Stacks	6	
Stack Height	42.875	ft
Stack Diameter	12.0	ft
Stack Exit Velocity	24.5	ft/sec
Exhaust Flow	166,000	ACFM
Exhaust Temp	70	F

Table B-9 Emergency Generator Emissions

Emission Source:	Emergency Generator
Source Type:	Diesel Generator
Engine Power (bhp):	2,193
Heat Input (mmBtu/hr):	16.91
Maximum Fuel Usage (gal/hr)	119.9
Number of Units:	1
Fuel Oil Heating Value (BTU/gal)	141,000
Sulfur Content of Fuel (wt. %):	0.0015
Operating Hours per Year:	500

Compound	Emission Factor	Emission Factor	Emission Rate	
			Hourly (d)	Annual (e)
	(g/kW-hr)	(g/hp-hr)	(lb/hr)	(ton/year)
Nitrogen Oxides (a)	6.4	4.8	23.08	5.77
Carbon Monoxide (a)	3.5	2.6	12.62	3.16
TOC (a)	6.4	4.8	23.08	5.77
Sulfur Oxides (b)	0.0015	0.0015	2.54E-02	6.34E-03
PM (a)	0.20	0.15	0.72	0.18
PM-10 (c)	0.40	0.30	1.44	0.36

Notes:

(a) Emission factors (g/kW-hr) for NOx, CO, TOC and PM are based on the NSPS Subpart IIII limits for Stationary Compression Ignition Internal Combustion Engines (reference 40 CFR 89.112 Table 1).

(b) lb/MMBtu based on fuel sulfur.

(c) Since AP-42 does not provide an emission factor for PM-10, the TSP emission rate was multiplied by a factor of 2 to conservatively estimate the contribution of condensables.

(d) Hourly Emission Rate (lb/hr) = Emission Factor (g/hp-hr) * Engine Power (hp) * (1 lb / 453.6 g)

(e) Annual Emission Rate (ton/yr) = Hourly Emission Rate (lb/hr) * Hour of Operation Per Year (hr/yr) / (2,000 lb/ton)

Stack Parameters (Each)

Stack Height	20.0	ft
Stack Diameter	1.23	ft
Stack Exit Velocity	135	ft/sec
Exhaust Flow	9,669	ACFM
Exhaust Temp	987	F

Table B-10 Emergency Fire-Water Pump Emissions

Emission Source:	Emergency Fire-Water Pump Engine
Source Type:	Diesel Fueled IC Reciprocating Engine
Engine Power (bhp):	298
Heat Input (mmBtu/hr):	2.30
Maximum Fuel Usage (gal/hr)	16.3
Number of Units:	1
Fuel Oil Heating Value (BTU/gal)	141,000
Sulfur Content of Fuel (wt. %):	0.0015
Operating Hours per Year:	500

Compound	Emission Factor	Emission Factor	Emission Rate	
			Hourly (d)	Annual (e)
	(g/kW-hr)	(g/hp-hr)	(lb/hr)	(ton/year)
Nitrogen Oxides (a)	4.0	3.0	1.96	0.49
Carbon Monoxide (a)	3.5	2.6	1.72	0.43
TOC (a)	4.0	3.0	1.96	0.49
Sulfur Oxides (b)	0.0015	0.0015	3.45E-03	8.62E-04
PM (a)	0.20	0.15	0.10	0.02
PM-10 (c)	0.40	0.30	0.20	0.05

Notes:

(a) Emission factors (g/kW-hr) for NOx, CO, TOC and PM are based on the NSPS Subpart IIII limits for Stationary Compression Ignition Internal Combustion Engines (reference 40 CFR 89.112 Table 1).

(b) lb/MMBtu based on fuel sulfur.

(c) Since AP-42 does not provide an emission factor for PM-10, the TSP emission rate was multiplied by a factor of 2 to conservatively estimate the contribution of condensables.

(d) Hourly Emission Rate (lb/hr) = Emission Factor (g/hp-hr) * Engine Power (hp) * (1 lb / 453.6 g)

(e) Annual Emission Rate (ton/yr) = Hourly Emission Rate (lb/hr) * Hour of Operation Per Year (hr/yr) / (2,000 lb/ton)

Stack Parameters

Stack Height	20.0	ft
Stack Diameter	0.44	ft
Stack Exit Velocity	135	ft/sec
Exhaust Flow	1,230	ACFM
Exhaust Temp	845	F

Appendix C

Control Technology Review

Appendix C

Emission Limits from EPA'S RACT/BACT/LAER Clearing House (December 2009)

Table	Page
Table C-1 Gas Turbine NOx Emission Limits from EPA'S RACT/BACT/LAER Clearing House (December 2009)	C-1
Table C-2 Gas Turbine CO Emission Limits from EPA'S RACT/BACT/LAER Clearing House (December 2009)	C-8
Table C-3 Gas Turbine VOC Emission Limits from EPA'S RACT/BACT/LAER Clearing House (December 2009)	C-16
Table C-4 Gas Turbine Particulate Matter Emission Limits from EPA'S RACT/BACT/LAER Clearing House (December 2009)	C-25
Table C-5 Gas Turbine SO2 Emission Limits from EPA'S RACT/BACT/LAER Clearing House (December 2009)	C-38
Table C-6 NOx Emission Limits for Boilers <250 MMBtu/hr from EPA'S RACT/BACT/LAER Clearing House (December 2009)	C-44
Table C-7 NOx Emission Limits for Fuel Gas Heaters from EPA'S RACT/BACT/LAER Clearing House (December 2009)	C-48
Table C-8 CO Emission Limits for Boilers <250 MMBtu/hr from EPA'S RACT/BACT/LAER Clearing House (December 2009)	C-50
Table C-9 CO Emission Limits for Fuel Gas Heaters from EPA'S RACT/BACT/LAER Clearing House (December 2009)	C-53

Table C-1 Gas Turbine NO_x Emission Limits from EPA'S RACT/BACT/LAER Clearing House (December 2009)

RBLCID	FACILITY NAME	COUNTY	STATE	PERMIT DATE	PROCESS NAME	Size	CASE-BY-CASE BASIS	Emission Limit	
CA-1050	IDC BELLINGHAM, LLC		CA	9/11/2000	GAS TURBINE: COMBINED CYCLE >= 50 MW	GAS TURBINE, 170 MW; STEAM TURBINE 185 MW	BACT-PSD	1.50 PPM @ 15% O2	
*TX-0548	MADISON BELL ENERGY CENTER	MADISON	TX	8/18/2009	ELECTRICITY GENERATION	275 MW	BACT-PSD	2.00 PPMVD	@ 15% O2 24-HR ROLLING AVG
*TX-0547	NATURAL GAS-FIRED POWER GENERATION FACILITY	LAMAR	TX	6/22/2009	ELECTRICITY GENERATION	250 MW	BACT-PSD	2.00 PPMVD	@ 15% O2 24-HR ROLLING AVG
*TX-0546	PATTILLO BRANCH POWER PLANT	FANNIN	TX	6/17/2009	ELECTRICITY GENERATION	350 MW	BACT-PSD	2.00 PPMVD	@ 15% O2 24-HR ROLLING AVG
*OK-0129	CHOUTEAU POWER PLANT	MAYES	OK	1/23/2009	COMBINED CYCLE COGENERATION >25MW	1882 MMBTU/H	BACT-PSD	2.00 PPMVD	@ 15% O2 24-HR ROLLING AVG
FL-0303	FPL WEST COUNTY ENERGY CENTER UNIT 3	PALM BEACH COUNTY	FL	7/30/2008	THREE NOMINAL 250 MW CTG (EACH) WITH SUPPLEMENTARY-FIRED HRSG	2333 MMBTU/H	BACT-PSD	2.00 PPMVD (GAS)	@ 15% O2 24-HR ROLLING AVG
CT-0151	KLEEN ENERGY SYSTEMS, LLC	MIDDLESEX	CT	2/25/2008	SIEMENS SGT6-5000F COMBUSTION TURBINE #1 AND #2 (NATURAL GAS FIRED) WITH 445 MMBTU/HR NATURAL GAS DUCT BURNER	2.1 MMCF/H	LAER	2.00 PPM @ 15% O2	1-HR BLOCK
*VA-0308	WARREN COUNTY FACILITY	WARREN	VA	1/14/2008	ELECTRIC GENERATION SECNARIO 3	2204 MMBTU/H	BACT-PSD	2.00 PPMVD	
*VA-0308	WARREN COUNTY FACILITY	WARREN	VA	1/14/2008	ELECTRIC GENERATION - SCENARIO 1	1717 MMBTU/H	BACT-PSD	2.00 PPM	
*VA-0308	WARREN COUNTY FACILITY	WARREN	VA	1/14/2008	ELECTRIC GENERATION - SCENARIO 2	1944 MMBTU	BACT-PSD	2.00 PPMVD	
CA-1144	BLYTHE ENERGY PROJECT II	RIVERSIDE	CA	4/25/2007	2 COMBUSTION TURBINES	170 MW	BACT-PSD	2.00 PPMVD	AT 15% O2, 3-HR AVG
NY-0098	ATHENS GENERATING PLANT	GREENE	NY	1/19/2007	FUEL COMBUSTION (GAS)	3100 MMBTU/H	LAER	2.00 PPMVD @ 15% O2	3 HOUR BLOCK AVAEAGE/STEADY STATE
FL-0286	FPL WEST COUNTY ENERGY CENTER	PALM BEACH	FL	1/10/2007	COMBINED CYCLE COMBUSTION GAS TURBINES - 6 UNITS	2333 MMBTU/H	BACT-PSD	2.00 PPMVD @15%O2	24-HR (GAS)
*NY-0095	CAITHNES BELLPORT ENERGY CENTER	SUFFOLK	NY	5/10/2006	COMBUSTION TURBINE	2221 MMBUT/H	BACT-PSD	2.00 PPMVD@15%02	
NV-0035	TRACY SUBSTATION EXPANSION PROJECT	STOREY COUNTY	NV	8/16/2005	TURBINE, COMBINED CYCLE COMBUSTION #1 WITH HRSG AND DUCT BURNER.	306 MW	BACT-PSD	2.00 PPM @ 15% O2	3-HOUR ROLLING
NV-0035	TRACY SUBSTATION EXPANSION PROJECT	STOREY COUNTY	NV	8/16/2005	TURBINE, COMBINED CYCLE COMBUSTION #2 WITH HRSG AND DUCT BURNER.	306 MW	BACT-PSD	2.00 PPM @ 15% O2	3-HOUR ROLLING
*OR-0041	WANAPA ENERGY CENTER	UMATILLA	OR	8/8/2005	COMBUSTION TURBINE & HEAT RECOVERY STEAM GENERATOR	2384.1 MMBTU/H	BACT-PSD	2.00 PPMDV @ 15% O2	3 HOURS
NY-0100	EMPIRE POWER PLANT	RENSSELAER	NY	6/23/2005	FUEL COMBUSTION (NATURAL GAS)	2099 MMBTU/H	LAER	2.00 PPMVD AT 15% O2	3-HOUR BLOCK AVE./ STEADY STATE

Table C-1 Gas Turbine NO_x Emission Limits from EPA'S RACT/BACT/LAER Clearing House (December 2009)

RBLCID	FACILITY NAME	COUNTY	STATE	PERMIT DATE	PROCESS NAME	Size	CASE-BY-CASE BASIS	Emission Limit	
FL-0263	FPL TURKEY POINT POWER PLANT	DADE	FL	2/8/2005	170 MW COMBUSTION TURBINE, 4 UNITS	170 MW	BACT-PSD	2.00 PPM @ 15 % O2	STACK TEST (CT & DUCT BURNER)
AZ-0047	WELLTON MOHAWK GENERATING STATION	YUMA	AZ	12/1/2004	COMBUSTION TURBINE GENERATORS AND HEAT RECOVERY STEAM GENERATORS - GE7FA TURBINES OPTION	170 MW	BACT-PSD	2.00 PPM AT 15% O2	THREE-HOUR
AZ-0047	WELLTON MOHAWK GENERATING STATION	YUMA	AZ	12/1/2004	COMBUSTION TURBINE GENERATORS AND HEAT RECOVERY STEAM GENERATORS - SW501F TURBINES OPTION	180 MW	BACT-PSD	2.00 PPM @ 15% O2	3-HOUR AVERAGE
*VA-0291	CPV WARREN LLC	WARREN	VA	7/30/2004	TURBINE, COMBINED CYCLE (2)	1717 MMBTU/H	Other Case-by-Case	2.00 PPM @ 15% O2	AS A ONE HOUR AVERAGE
NV-0037	COPPER MOUNTAIN POWER	CLARK	NV	5/14/2004	LARGE COMBUSTION TURBINES, COMBINED CYCLE & COGENERATION	600 MW	BACT-PSD	2.00 PPM @ 15% O2	15% OXYGEN, 3-HR AVERAGE
NV-0038	IVANPAH ENERGY CENTER, L.P.	CLARK	NV	12/29/2003	LARGE COMBUSTION TURBINES, COMBINED CYCLE & COGENERATION	500 MW	BACT-PSD	2.00 PPM@ 15% O2	15% OXYGEN, ONE HOUR AVERAGE
AZ-0043	DUKE ENERGY ARLINGTON VALLEY (AVEFII)	MARICOPA	AZ	11/12/2003	TURBINE, COMBINED CYCLE & DUCT BURNER	325 MW	BACT-PSD	2.00 PPM @ 15% O2	1 hr avg
AZ-0043	DUKE ENERGY ARLINGTON VALLEY (AVEFII)	MARICOPA	AZ	11/12/2003	TURBINE, COMBINED CYCLE	325 MW	BACT-PSD	2.00 PPM @ 15% O2	1 hr avg
AZ-0049	LA PAZ GENERATING FACILITY	LA PAZ	AZ	9/4/2003	SIEMENS WESTINGHOUSE COMBUSTION TURBINES AND HEAT RECOVERY STEAM GENERATORS	1080 MW	BACT-PSD	2.00 PPM @ 15% O2	THREE HOUR AVERAGE AT 15% OXYGEN
AZ-0049	LA PAZ GENERATING FACILITY	LA PAZ	AZ	9/4/2003	GE COMBUSTION TURBINES AND HEAT RECOVERY STEAM GENERATORS	1040 MW	BACT-PSD	2.00 PPM @ 15 O2	THREE HOUR AVERAGE AT 15% OXYGEN
CA-0997	SACRAMENTO MUNICIPAL UTILITY DISTRICT	SACRAMENTO COUNTY	CA	9/1/2003	GAS TURBINES, (2)	1611 MMBTU/H	LAER	2.00 PPM @ 15% O2	
CA-1096	VERNON CITY LIGHT & POWER	LOS ANGELES	CA	5/27/2003	GAS TURBINE: COMBINED CYCLE < 50 MW	43 MW GAS TURBINE, 55 MW STEAM TURBINE	BACT-PSD	2.00 PPM @ 15% O2	1H
CA-1097	MAGNOLIA POWER PROJECT, SCPPA	LOS ANGELES	CA	5/27/2003	GAS TURBINE: COMBINED CYCLE >= 50 MW	181 NET MW (GAS TURBINE W/STEAM INJECTION)	BACT-PSD	2.00 PPM @ 15% O2	3 H AVG. TIME
WA-0315	SUMAS ENERGY 2 GENERATION FACILITY	WHATCOM	WA	4/17/2003	TURBINES, COMBINED CYCLE, (2)	660 MW	BACT-PSD	2.00 PPM @ 15% O2	3 h avg
AZ-0039	SALT RIVER PROJECT/SANTAN GEN. PLANT	MARICOPA	AZ	3/7/2003	TURBINE, COMBINED CYCLE, DUCT BURNER, NATURAL GAS	175 MW	LAER	2.00 PPM @ 15% O2	1 h avg
AZ-0038	GILA BEND POWER GENERATING STATION	MARICOPA	AZ	5/15/2002	TURBINE, COMBINED CYCLE, DUCT BURNER, NATURAL GAS	170 MW	BACT-PSD	2.00 PPM @ 15% O2	1-hr avg
PA-0226	LIMERICK POWER STATION	MONTGOMERY	PA	4/9/2002	TURBINE, COMBINED CYCLE	550 MW	LAER	2.00 PPM @ 15% O2	
PA-0189	CONECTIV BETHLEHEM, INC.	NORTHAMPTON	PA	1/16/2002	TURBINE, COMBINED CYCLE, (6)	122 MW	LAER	2.00 PPMVD	@ 15% O2 24-HR ROLLING AVG

Table C-1 Gas Turbine NO_x Emission Limits from EPA'S RACT/BACT/LAER Clearing House (December 2009)

RBLCID	FACILITY NAME	COUNTY	STATE	PERMIT DATE	PROCESS NAME	Size	CASE-BY-CASE BASIS	Emission Limit	
NJ-0058	PSEG FOSSIL LLC LINDEN GENERATING STATION	UNION	NJ	8/24/2001	COMBUSTION GAS TURBINES(GE 7FA)(4 UNITS): COMBINED CYCLE	1651 MMBTU/H	BACT-PSD	2.00 PPM @ 15% O2	
WA-0302	GOLDENDALE ENERGY PROJECT	KLICKITAT	WA	2/23/2001	COMBINED CYCLE UNIT (TURBINE/HRSG)	248.7 MW	BACT-PSD	2.00 PPM @ 15% O2	3-H AV, EXCEPT STARTUP
NV-0034	LAS VEGAS COGENERATION FACILITY	CLARK	NV	11/13/2000	TURBINE, COMBINED CYCLE	176 MW	BACT-PSD	2.00 PPM @ 15% O2	THREE-HOUR AVERAGE
MA-0027	CABOT POWER CORPORATION	SUFFOLK	MA	5/7/2000	TURBINE, COMBINED CYCLE, NATURAL GAS	2493 MMBTU/H	LAER	2.00 PPM @ 15% O2	
RI-0019	RHODE ISLAND STATE ENERGY CENTER	PROVIDENCE	RI	5/3/2000	TURBINE, COMBINED CYCLE (2)	186 MW	LAER	2.00 PPM @ 15% O2	
MA-0029	SITHE MYSTIC DEVELOPMENT LLC	SUFFOLK	MA	9/29/1999	TURBINE, COMBINED CYCLE, NATURAL GAS (2)	2699 MMBTU/H	BACT-PSD	2.00 PPM @ 15% O2	
MA-0025	ANP BELLINGHAM ENERGY COMPANY	NORFOLK	MA	8/4/1999	TURBINES, COMBINED CYCLE, NATURAL GAS, (2)	3630 MMBTU/H	LAER	2.00 PPM @ 15% O2	
CT-0139	PDC EL PASO MILFORD LLC	NEW HAVEN	CT	4/16/1999	TURBINE, COMBUSTION, ABB GT-24, #1 WITH 2 CHILLERS	1.97 MMCF/H	LAER	2.00 PPM @ 15% O2	
CT-0140	PDC EL PASO MILFORD LLC	NEW HAVEN	CT	4/16/1999	TURBINE, COMBUSTION, ABB GT-24E,#2 WITH 2 CHILLERS	1.97 MMCF/H	LAER	2.00 PPM @ 15% O2	
MA-0024	ANP BLACKSTONE ENERGY COMPANY	WORCESTER	MA	4/16/1999	TURBINE, COMBINED CYCLE, NATURAL GAS, (2)	3630 MMBTU/H	LAER	2.00 PPM @ 15% O2	
UT-0066	CURRANT CREEK	JUAB	UT	5/17/2004	NATURAL GAS FIRED TURBINES AND HEAT RECOVERY STEAM GENERATORS		BACT-PSD	2.25 PPM @ 15% O2	3-H COMBINED CYCLE AV
FL-0304	CANE ISLAND POWER PARK	OSCEOLA	FL	9/8/2008	300 MW COMBINED CYCLE COMBUSTION TURBINE	1860 MMBTU/H	BACT-PSD	2.50 PPM @ 15% O2	24-HR
FL-0265	HINES POWER BLOCK 4	POLK	FL	6/8/2005	COMBINED CYCLE TURBINE	530 MW	BACT-PSD	2.50 PPM @ 15% O2	
MI-0366	BERRIEN ENERGY, LLC	BERRIEN	MI	4/13/2005	3 COMBUSTION TURBINES AND DUCT BURNERS	1584 MMBTU/H	BACT-PSD	2.50 PPM @ 15% O2	24-HOUR ROLLING AVG EACH HOUR
*WA-0328	BP CHERRY POINT COGENERATION PROJECT	WHATCOM COUNTY	WA	1/11/2005	GE 7FA COMBUSTION TURBINE & HEAT RECOVERY STEAM GENERATOR	174 MW	BACT-PSD	2.50 3-HR @ 15%O2	*SEE NOTES
CA-1142	PASTORIA ENERGY FACILITY	KERN	CA	12/23/2004	3 COMBUSTION TURBINES	168 MW	BACT-PSD	2.50 @ 15% O2, 1-HR AVG	@ 15% O2, 1-HR AVG
CA-1143	SUTTER POWER PLANT	SUTTER	CA	8/16/2004	2 COMBUSTION TURBINES	170 MW	BACT-PSD	2.50 AT 15% O2, 1-HR AVG	AT 15% O2, 1-HR AVG
VA-0289	DUKE ENERGY WYTHE, LLC	WYTHE	VA	2/5/2004	TURBINE, COMBINED CYCLE, DUCT BURNER, NATURAL GAS	170 MW	BACT-PSD	2.50 PPM @ 15% O2	
VA-0289	DUKE ENERGY WYTHE, LLC	WYTHE	VA	2/5/2004	TURBINE, COMBINED CYCLE, NATURAL GAS	170 MW	BACT-PSD	2.50 PPM @ 15% O2	
OR-0039	COB ENERGY FACILITY, LLC	KLAMATH	OR	12/30/2003	TURBINE, COMBINED CYCLE, DUCT BURNER, NAT GAS, (4)	1150 MW	BACT-PSD	2.50 PPM @ 15% O2	4-h rolling avg
VA-0287	JAMES CITY ENERGY PARK	JAMES CITY	VA	12/1/2003	TURBINE, COMBINED CYCLE, NATURAL GAS	1973 MMBTU/H	BACT-PSD	2.50 PPM @ 15% O2	
VA-0287	JAMES CITY ENERGY PARK	JAMES CITY	VA	12/1/2003	TURBINE, COMBINED CYCLE, NATURAL GAS,DUCT BURNER	1973 MMBTU/H	BACT-PSD	2.50 PPM @ 15% O2	
FL-0256	HINES ENERGY COMPLEX, POWER BLOCK 3	POLK	FL	9/8/2003	COMBUSTION TURBINES, COMBINED CYCLE, NATURAL GAS,2	1830 MMBTU/H	BACT-PSD	2.50 PPMVD @15% O2	

Table C-1 Gas Turbine NO_x Emission Limits from EPA'S RACT/BACT/LAER Clearing House (December 2009)

RBLCID	FACILITY NAME	COUNTY	STATE	PERMIT DATE	PROCESS NAME	Size	CASE-BY-CASE BASIS	Emission Limit	
GA-0105	MCINTOSH COMBINED CYCLE FACILITY	EFFINGHAM	GA	4/17/2003	TURBINE, COMBINED CYCLE, NATURAL GAS, (4)	140 MW	BACT-PSD	2.50 PPM @ 15% O2	
FL-0244	FPL MARTIN PLANT	MARTIN COUNTY	FL	4/16/2003	TURBINE, COMBINED CYLE, NATURAL GAS, (4)	170 MW	BACT-PSD	2.50 PPM @ 15% O2	24-HR CEM
FL-0244	FPL MARTIN PLANT	MARTIN COUNTY	FL	4/16/2003	TURBINE, COMBINED CYCLE WITH DUCT BURNER, NAT GAS	170 MW	BACT-PSD	2.50 PPM @ 15% O2	
FL-0245	FPL MANATEE PLANT - UNIT 3	MANATEE	FL	4/15/2003	TURBINE, COMBINED CYCLE, NATURAL GAS (4)	170 MW	BACT-PSD	2.50 PPM @ 15% O2	24-H CEM
WY-0061	BLACK HILLS CORP./NEIL SIMPSON TWO	CAMPBELL	WY	4/4/2003	TURBINE, COMBINED CYCLE, & DUCT BURNER	40 MW	Other Case-by-Case	2.50 PPM @ 15% O2	24 h rolling avg
OR-0040	KLAMATH GENERATION, LLC	KLAMATH	OR	3/12/2003	TURBINE, COMBINED CYCLE, DUCT BURNER, NAT GAS (2)	480 MW	BACT-PSD	2.50 PPM @ 15% O2	8-h rolling avg
WA-0291	WALLULA POWER PLANT	WALLA WALLA	WA	1/3/2003	TURBINE, COMBINED CYCLE, NATURAL GAS (4)	1300 MW	Other Case-by-Case	2.50 PPM @ 15% O2	3 HR AVG
VA-0262	MIRANT AIRSIDE INDUSTRIAL PARK	PITTSYLVANIA	VA	12/6/2002	TURBINE, COMBINED CYCLE, (2)	170 MW	BACT-PSD	2.50 PPM @ 15% O2	each unit @ full pressure
VA-0260	HENRY COUNTY POWER	HENRY	VA	11/21/2002	TURBINE, COMBINED CYCLE, (4), 100% LOAD	171 MW	BACT-PSD	2.50 PPM @ 15% O2	each unit
VA-0261	CPV CUNNINGHAM CREEK	FLUVANNA	VA	9/6/2002	TURBINE, COMBINED CYCLE, (2)	2132 MMBTU/H	BACT-PSD	2.50 PPM @ 15% O2	70-100% LOAD
AL-0185	BARTON SHOALS ENERGY	COLBERT	AL	7/12/2002	FOUR (4) COMBINED CYCLE COMBUSTION TURBINE UNITS	173 MW	BACT-PSD	2.50 PPM @ 15% O2	
NJ-0043	LIBERTY GENERATING STATION	UNION	NJ	3/28/2002	COMBINED CYCLE TURBINE WITH DUCT BURNER	3202 MMBTU/H	Other Case-by-Case	2.50 PPMVD @ 15% O2	
NJ-0043	LIBERTY GENERATING STATION	UNION	NJ	3/28/2002	COMBINED CYCLE TURBINE (3)	2964 MMBTU/H	Other Case-by-Case	2.50 PPMVD @ 15% O2	
PA-0188	FAIRLESS ENERGY LLC	BUCKS	PA	3/28/2002	TURBINE, COMBINED CYCLE	1190 MW	LAER	2.50 PPM @ 15% O2	
PA-0223	DUKE ENERGY FAYETTE, LLC	FAYETTE	PA	1/30/2002	TURBINE, COMBINED CYCLE, (2)	280 MW	LAER	2.50 PPM @ 15% O2	
FL-0241	CPV CANA	ST LUCIE COUNTY	FL	1/17/2002	TURBINE, COMBINED CYCLE, NATURAL GAS	1680 MMBTU/H	BACT-PSD	2.50 PPM @ 15% O2	
OR-0035	PORT WESTWARD PLANT	COLUMBIA	OR	1/16/2002	(2) COMBUSTION TURBINES, WITH DUCT BURNER	325 MW, EACH	BACT-PSD	2.50 PPM @ 15% O2	EACH, EXCEPT STARTUP AND SHUTDOWN
IN-0095	ALLEGHENY ENERGY SUPPLY CO. LLC	ST. JOSEPH	IN	12/7/2001	2 CMBND CYCLE COMBUST. TURBINE WESTINGHOUSE 501F	2071 MMBTU/H (HHV)	BACT-PSD	2.50 PPM @15%O2	(3 HR AV)
WA-0292	SATSOP COMBUSTION TURBINE PROJECT	GRAYS HARBOR	WA	10/23/2001	(2) NAT GAS COMBINED CYCLE COMBUSTION TURBINES	325 MW	BACT-PSD	2.50 PPM @ 15% O2	1-H AV, EACH TURBINE
ID-0010	MIDDLETON FACILITY	CANYON	ID	10/19/2001	(2) GAS TURBINES WITHOUT DUCT BURNERS, NAT GAS		BACT-PSD	2.50 PPM @ 15% O2	EA, CONSECUTIVE 12 MO AV
ID-0010	MIDDLETON FACILITY	CANYON	ID	10/19/2001	(2) GAS TURBINES WITH DUCT BURNERS, NAT GAS	2097 MMBTU/H	BACT-PSD	2.50 PPM @ 15% O2	CONSECUTIVE 12 MO AV, EACH
MD-0033	KELSON RIDGE	CHARLES	MD	9/27/2001	COMBINED CYCLE COMBUSTION TURBINE W/ HRSG & DUCT	180 MW	LAER	2.50 PPM @ 15% O2	3-HR ROLLING AVG.

Table C-1 Gas Turbine NO_x Emission Limits from EPA'S RACT/BACT/LAER Clearing House (December 2009)

RBLCID	FACILITY NAME	COUNTY	STATE	PERMIT DATE	PROCESS NAME	Size	CASE-BY-CASE BASIS	Emission Limit
FL-0226	EL PASO MANATEE ENERGY CENTER	MANATEE	FL	9/11/2001	TURBINE, COMBINED CYCLE, NAT. GAS	1.79 MMCF/H	BACT-PSD	2.50 PPM @ 15% O2
FL-0227	EL PASO BELLE GLADE ENERGY CENTER	PALM BEACH	FL	9/7/2001	TURBINE, COMBINED CYCLE, NAT. GAS	1.79 MMCF/H	BACT-PSD	2.50 PPM @ 15% O2
WA-0288	LONGVIEW ENERGY DEVELOPMENT	COWLITZ	WA	9/4/2001	COMBUSTION TURBINE, COMBINEDCYCLE (NG)	290 MW	Other Case-by-Case	2.50 PPM @ 15% O2 365 DAY AVG
TX-0344	DEER PARK ENERGY CENTER	HARRIS	TX	8/22/2001	(4) CTG1-4 & HRSG1-4, ST-1 THRU -4	180 MW, EA	LAER	2.50 PPM @ 15% O2 3-H AND ANN AVER
FL-0225	EL PASO BROWARD ENERGY CENTER	BROWARD	FL	8/17/2001	TURBINE, COMBINED CYCLE, NAT. GAS	1.79 MMCF/H	BACT-PSD	2.50 PPM @ 15% O2
FL-0240	CPV PIERCE	POLK	FL	8/7/2001	TURBINE, COMBINED CYCLE, NATURAL GAS	1680 MMBTU/H	BACT-PSD	2.50 PPM @ 15% O2
PA-0179	SWEC LLC	BUCKS	PA	8/7/2001	TURBINE, NATURAL GAS FIRED	0	Other Case-by-Case	2.50 PPM@ 15% O2
PA-0228	SPRINGDALE TOWNSHIP STATION	ALLEGHENY	PA	7/12/2001	TURBINE, COMBINED CYCLE	2094 MMBTU/H	BACT-PSD	2.50 PPM @ 15% O2 during any three hour time period
NJ-0044	MANTUA CREEK GENERATING FACILITY	GLOUCESTER	NJ	6/26/2001	COMBUSTION TURBINE WITH DUCT BURNER (3)	2181 MMBTU/H	Other Case-by-Case	2.50 PPMVD @ 15% O2
NJ-0044	MANTUA CREEK GENERATING FACILITY	GLOUCESTER	NJ	6/26/2001	COMBUSTION TURBINE WITHOUT DUCT BURNER, 60% LOAD		N/A	2.50 PPM @ 15% O2
NJ-0044	MANTUA CREEK GENERATING FACILITY	GLOUCESTER	NJ	6/26/2001	COMBUSTION TURBINE WITHOUT DUCT BURNER, 75% LOAD		Other Case-by-Case	2.50 PPMVD @ 15% O2
NJ-0044	MANTUA CREEK GENERATING FACILITY	GLOUCESTER	NJ	6/26/2001	COMBUSTION TURBINE WITHOUT DUCT BURNER		Other Case-by-Case	2.50 PPMVD @ 15% O2
CA-0949	MOUNTAINVIEW POWER	SAN BERNARDINO	CA	5/22/2001	TURBINE, COMBINED CYCLE, NATURAL GAS, (4)	175.7 MW	LAER	2.50 PPM @ 15% O2
NJ-0059	COGEN TECHNOLOGIES LINDEN VENTURE, L.P	UNION	NJ	5/9/2001	COMBUSTION GAS TURBINE(GE): COMBINED CYCLE(THE 6TH UNIT)	1928.2 MMBTU/H	BACT-PSD	2.50 PPM @ 15% O2
AZ-0033	MESQUITE GENERATING STATION	MARICOPA	AZ	3/22/2001	TURBINE, COMBINED CYCLE, NATURAL GAS	1923 MMBTU/H	BACT-PSD	2.50 PPM @ 15% O2
AZ-0041	KYRENE GENERATING STATION, SALT RIVER PROJECT	MARICOPA	AZ	3/14/2001	TURBINE, COMBINED CYCLE, DUCT BURNER, NAT GAS	175 MW	LAER	2.50 PPM @ 15% O2 3 H avg
AZ-0034	HARQUAHALA GENERATING PROJECT	MARICOPA	AZ	2/15/2001	COMBINED CYCLE, NATURAL GAS	2362 MMBTU/H	Other Case-by-Case	2.50 PPM @ 15% O2
AZ-0035	DUKE ENERGY ARLINGTON VALLEY	MARICOPA	AZ	12/14/2000	TURBINE, COMBINED CYCLE	255 MW	BACT-PSD	2.50 PPM @ 15% O2 3 hr avg
AZ-0036	PINNACLE WEST ENERGY CORP./REDHAWK GEN. FACILITY	MARICOPA	AZ	12/2/2000	TURBINE, COMBINED CYCLE, DUCT BURNER	175 MW	BACT-PSD	2.50 PPM @ 15% O2
PA-0160	CALPINE CONSTRUCTION FINANCE CO., LP	BERKS	PA	10/10/2000	TURBINE, COMBINED CYCLE, NATURAL GAS	182 MW	LAER	2.50 PPM @ 15% O2
PA-0184	CALPINE BERKS ONTELAUNEE POWER PLANT	BERKS	PA	10/10/2000	TURBINES, COMBINED CYCLE, (2)	544 MW	LAER	2.50 PPM @ 15% O2

Table C-1 Gas Turbine NO_x Emission Limits from EPA'S RACT/BACT/LAER Clearing House (December 2009)

RBLCID	FACILITY NAME	COUNTY	STATE	PERMIT DATE	PROCESS NAME	Size	CASE-BY-CASE BASIS	Emission Limit	
CA-0950	VALERO REFINING COMPANY	SOLANO COUNTY	CA	1/11/2000	COMBUSTION TURBINE, COMBINED CYCLE, (2)	102 MW	LAER	2.50 PPM @ 15% O2	
NH-0012	NEWINGTON ENERGY LLC	ROCKINGAM	NH	4/26/1999	TURBINES, COMBINED CYCLE, NATURAL GAS	160 MW	BACT-PSD	2.50 PPM @ 15% O2	gas, 3 hr block avg
NH-0011	AES LONDONDERRY, LLC	ROCKINGHAM	NH	4/26/1999	TURBINE, COMBINED CYCLE, NAT GAS, #1 & #2	2849 MMBTU/H	BACT-PSD	2.50 PPM @ 15% O2	
CO-0056	ROCKY MOUNTAIN ENERGY CENTER, LLC	WELD	CO	5/2/2006	NATURAL-GAS FIRED, COMBINED-CYCLE TURBINE	300 MW	BACT-PSD	3.00 PPM @ 15% O2	
NC-0101	FORSYTH ENERGY PLANT	FORSYTH	NC	9/29/2005	TURBINE, COMBINED CYCLE, NATURAL GAS, (3)	1844.3 MMBTU/H	BACT-PSD	3.00 PPM @ 15% O2	
NY-0100	EMPIRE POWER PLANT	RENSSELAER	NY	6/23/2005	FUEL COMBUSTION (NATURAL GAS) DUCT BURNING	646 MMBTU/H	LAER	3.00 PPMVD AT 15% O2	3-HOUR BLOCK AVE./ STEADY STATE
LA-0192	CRESCENT CITY POWER	ORLEANS	LA	6/6/2005	GAS TURBINES - 187 MW (2)	2006 MMBTU/H	BACT-PSD	3.00 PPM	ANNUAL AVERAGE
OH-0252	DUKE ENERGY HANGING ROCK ENERGY FACILITY	LAWRENCE	OH	12/28/2004	TURBINES (4) (MODEL GE 7FA), DUCT BURNERS OFF	172 MW	BACT-PSD	3.00 PPM @ 15% O2	3-HR AVERAGE
OH-0252	DUKE ENERGY HANGING ROCK ENERGY FACILITY	LAWRENCE	OH	12/28/2004	TURBINES (4) (MODEL GE 7FA), DUCT BURNERS ON	172 MW	BACT-PSD	3.00 PPM @ 15% O2	3-HR AVERAGE
MN-0053	FAIRBAULT ENERGY PARK	RICE	MN	7/15/2004	TURBINE, COMBINED CYCLE, NATURAL GAS (1)	1876 MMBTU/H	BACT-PSD	3.00 PPMVD @ 15% 02	3 HOUR AVERAGE
MN-0054	MANKATO ENERGY CENTER	BLUE EARTH	MN	12/4/2003	COMBUSTION TURBINE, LARGE, 2 EACH	1916 MMBTU/H	BACT-PSD	3.00 PPM @ 15% O2	
MI-0357	KALKASKA GENERATING, INC	KALKASKA	MI	2/4/2003	TURBINE, COMBINED CYCLE, (2)	605 MW	BACT-PSD	3.00 PPM @ 15% O2	
MI-0361	SOUTH SHORE POWER LLC	BERRIEN	MI	1/30/2003	TURBINE, COMBINED CYCLE, (2)	172 MW	BACT-PSD	3.00 PPM @ 15% O2	
GA-0101	MURRAY ENERGY FACILITY	MURRAY	GA	10/23/2002	TURBINE, COMBINED CYCLE, (4)	173 MW	BACT-PSD	3.00 PPM @ 15% O2	
OH-0248	LAWRENCE ENERGY	LAWRENCE	OH	9/24/2002	TURBINES (3), COMBINED CYCLE, DUCT BURNERS OFF	180 MW	BACT-PSD	3.00 PPM @ 15% O2	
OH-0248	LAWRENCE ENERGY	LAWRENCE	OH	9/24/2002	TURBINES (3), COMBINED CYCLE, DUCT BURNERS ON	180 MW	BACT-PSD	3.00 PPM @ 15% O2	
CO-0052	ROCKY MOUNTAIN ENERGY CENTER, LLC.	WELD	CO	8/11/2002	TWO (2) NATURAL GAS FIRED, COMBINED-CYCLE, TURBINE	2311 MMBTU/H	BACT-PSD	3.00 PPM @ 15% O2	
IN-0114	MIRANT SUGAR CREEK LLC	VIGO	IN	7/24/2002	TURBINE, COMBINED CYCLE, NATURAL GAS (4)	1490.5 MMBTU/H	BACT-PSD	3.00 PPM @ 15% O2	
IN-0114	MIRANT SUGAR CREEK LLC	VIGO	IN	7/24/2002	TURBINE, COMBINED CYCLE AND DUCT BURNER, NAT GAS	1490.5 MMBTU/H	BACT-PSD	3.00 PPM @ 15% O2	
MT-0019	CONTINENTAL ENERGY SERVICES, INC., SILVER BOW GEN	SILVER BOW	MT	6/7/2002	TURBINE, COMBINED CYCLE 1	500 MW	BACT-PSD	3.00 PPM @ 15% O2	
MT-0019	CONTINENTAL ENERGY SERVICES, INC., SILVER BOW GEN	SILVER BOW	MT	6/7/2002	TURBINE, COMBINED CYCLE 2	500 MW	BACT-PSD	3.00 PPM @ 15% O2	
IA-0058	GREATER DES MOINES ENERGY CENTER	POLK	IA	4/10/2002	COMBUSTION TURBINES - COMBINED CYCLE	350 MW	BACT-PSD	3.00 PPM @ 15% O2	CALCULATED

Table C-1 Gas Turbine NO_x Emission Limits from EPA'S RACT/BACT/LAER Clearing House (December 2009)

RBLCID	FACILITY NAME	COUNTY	STATE	PERMIT DATE	PROCESS NAME	Size	CASE-BY-CASE BASIS	Emission Limit
WA-0289	TRANSALTA CENTRALIA GENERATION LLC	LEWIS	WA	2/22/2002	(4) TURBINE/HRSG		BACT-PSD	3.00 PPM @ 15% O2 3 H AV
GA-0102	WANSLEY COMBINED CYCLE ENERGY FACILITY	HEARD	GA	1/15/2002	TURBINE, COMBINED CYCLE, (2)	167 MW	BACT-PSD	3.00 PPM @ 15% O2
VA-0256	TENASKA FLUVANNA	FLUVANNA	VA	1/11/2002	TURBINES, COMBINED CYCLE, (3), NATURAL GAS	61200 MMSCF/YR	BACT-PSD	3.00 PPMVD @ 15% O2
GA-0094	EFFINGHAM COUNTY POWER, LLC	EFFINGHAM	GA	12/27/2001	TURBINE, COMBINED CYCLE, (2)	185 MW	BACT-PSD	3.00 PPM @ 15% O2
GA-0093	AUGUSTA ENERGY CENTER	RICHMOND	GA	10/28/2001	TURBINE, COMBINED CYCLE, (3)	750 MW	BACT-PSD	3.00 PPM @ 15% O2
ID-0012	GARNET ENERGY, MIDDLETON FACILITY	CANYON	ID	10/19/2001	TURBINE, COMBINED CYCLE, NATURAL GAS, (2)	1707 MMBTU/H	BACT-PSD	3.00 PPM @ 15% O2 24 HOUR AVERAGE
IN-0110	COGENTRIX LAWRENCE CO., LLC	LAWRENCE	IN	10/5/2001	TURBINES, COMBINED CYCLE, & DUCT BURNERS, (3)	1944.1 MMBTU/H	BACT-PSD	3.00 PPM @ 15% O2
IN-0110	COGENTRIX LAWRENCE CO., LLC	LAWRENCE	IN	10/5/2001	TURBINES, COMBINED CYCLE, (3)	1944.1 MMBTU/H	BACT-PSD	3.00 PPM @ 15% O2
PA-0196	SWEC-FALLS TOWNSHIP	BUCKS	PA	8/7/2001	TURBINE, COMBINED CYCLE, NATURAL GAS	544 MW	LAER	3.00 PPM @ 15% O2
MI-0302	MIRANT WYANDOTTE LLC	WAYNE	MI	7/25/2001	GAS TURBINES, COMBINED CYCLE, 2 EACH	2205 MMBTU/H	BACT-PSD	3.00 PPM @ 15% O2
IN-0085	PSEG LAWRENCEBURG ENERGY FACILITY	DEARBORN	IN	6/7/2001	TURBINE, NATURAL GAS, COMBINED CYCLE FOUR	476.6 MMBTU/H	BACT-PSD	3.00 PPMDV @ 15% O2
IN-0086	MIRANT SUGAR CREEK, LLC	VIGO	IN	5/9/2001	TURBINE, NATURAL GAS, COMBINED CYCLE	170 MW	BACT-PSD	3.00 PPM @ 15% O2
AZ-0037	PANDA GILA RIVER	MARICOPA	AZ	2/23/2001	TURBINE, COMBINED CYCLE, DUCT BURNER	170 MW	BACT-PSD	3.00 PPM @ 15% O2
DE-0016	HAY ROAD POWER COMPLEX UNITS 5-8	NEW CASTLE	DE	10/17/2000	TURBINES (3), COMBINED CYCLE, NG PREMIXED MODE	500 MW	LAER	3.00 PPM @ 15% O2 BASE LOAD
DE-0016	HAY ROAD POWER COMPLEX UNITS 5-8	NEW CASTLE	DE	10/17/2000	TURBINES (3), POLLUTANTS OTHER THAN NOX	500 MW	LAER	3.00 PPM @ 15% O2
IN-0092	WHITING CLEAN ENERGY, INC.	LAKE	IN	7/20/2000	TURBINES, COMBUSTION, NATURAL GAS (2)	1735 MMBTU/H	BACT-PSD	3.00 PPM @ 15% O2
IN-0092	WHITING CLEAN ENERGY, INC.	LAKE	IN	7/20/2000	TURBINES, COMBUSTION, NAT GAS (2) W/DUCT BURNER	1735 MMBTU/H	BACT-PSD	3.00 PPM @ 15% O2
TX-0250	CHANNELVIEW COGENERATION FACILITY	HARRIS	TX	12/9/1999	COGENERATION FACILITY	800 MW	LAER	3.00 PPM @ 15% O2 ANNUAL AVG
AZ-0044	SALT RIVER PROJECT/ DESERT BASIN GENERATING PRJ	PINAL	AZ	9/10/1999	TURBINE, COMBINED CYCLE	290 MW	BACT-PSD	3.00 PPM @ 15% O2
AZ-0044	SALT RIVER PROJECT/ DESERT BASIN GENERATING PRJ	PINAL	AZ	9/10/1999	TURBINE, COMBINED CYCLE WITH DUCT BURNERS	290 MW	BACT-PSD	3.00 PPM @ 15% O2

Table C-2 Gas Turbine CO Emission Limits from EPA'S RACT/BACT/LAER Clearing House (December 2009)

RBLCID	FACILITY NAME	COUNTY	STATE	PERMIT DATE	PROCESS NAME	Size	CASE-BY-CASE BASIS	Emission Limit	
CT-0151	KLEEN ENERGY SYSTEMS, LLC	MIDDLESEX	CT	2/25/2008	SIEMENS SGT6-5000F COMBUSTION TURBINE #1 AND #2 (NATURAL GAS FIRED) WITH 445 MMBTU/HR NATURAL GAS DUCT BURNER	2.1 MMCF/H	BACT-PSD	0.90 PPMVD @ 15 % O2	1 HR-BLOCK (W/OUT DUCT BURNER)
*VA-0308	WARREN COUNTY FACILITY	WARREN	VA	1/14/2008	ELECTRIC GENERATION - SCENARIO 2	1944 MMBTU	BACT-PSD	1.20 PPMVD	WITH DUCT BURNER FIRING
*VA-0308	WARREN COUNTY FACILITY	WARREN	VA	1/14/2008	ELECTRIC GENERATION - SCENARIO 1	1717 MMBTU/H	BACT-PSD	1.30 PPMVD	WITHOUT POWER AUGMENTATION
*VA-0291	CPV WARREN LLC	WARREN	VA	7/30/2004	TURBINE, COMBINED CYCLE (2)	1717 MMBTU/H	N/A	1.30 PPM @ 15% O2	W/O POWER AUGMENTATION
*VA-0308	WARREN COUNTY FACILITY	WARREN	VA	1/14/2008	ELECTRIC GENERATION SECNARIO 3	2204 MMBTU/H	BACT-PSD	1.80 PPMVD	WITHOUT DUCT BURNER FIRING
*VA-0291	CPV WARREN LLC	WARREN	VA	7/30/2004	TURBINE, COMBINED CYCLE AND DUCT BURNER (2)	1717 MMBTU/H	Other Case-by-Case	1.80 PPM @ 15% O2	POWER AUGMENTATION DUCT BURNING
*TX-0546	PATTILLO BRANCH POWER PLANT	FANNIN	TX	6/17/2009	ELECTRICITY GENERATION	350 MW	BACT-PSD	2.00 PPMVD	@ 15% O2, 3-HR ROLLING AVG
*NY-0095	CAITHNES BELLPORT ENERGY CENTER	SUFFOLK	NY	5/10/2006	COMBUSTION TURBINE	2221 MMBUT/H	BACT-PSD	2.00 PPMVD@15%02	
*OR-0041	WANAPA ENERGY CENTER	UMATILLA	OR	8/8/2005	COMBUSTION TURBINE & HEAT RECOVERY STEAM GENERATOR	2384.1 MMBTU/H	BACT-PSD	2.00 PPM @ 15% O2	3 HOURS
MI-0366	BERRIEN ENERGY, LLC	BERRIEN	MI	4/13/2005	3 COMBUSTION TURBINES AND DUCT BURNERS	1584 MMBTU/H	BACT-PSD	2.00 PPM @ 15% O2	3-HOUR BLOCK
*WA-0328	BP CHERRY POINT COGENERATION PROJECT	WHATCOM COUNTY	WA	1/11/2005	GE 7FA COMBUSTION TURBINE & HEAT RECOVERY STEAM GENERATOR	174 MW	BACT-PSD	2.00 PPM@ 15 % 02	UNITS NOT AVAILABLE *SEE NOTES
OR-0039	COB ENERGY FACILITY, LLC	KLAMATH	OR	12/30/2003	TURBINE, COMBINED CYCLE, DUCT BURNER, NAT GAS, (4)	1150 MW	BACT-PSD	2.00 PPM @ 15% O2	
AZ-0043	DUKE ENERGY ARLINGTON VALLEY (AVEFII)	MARICOPA	AZ	11/12/2003	TURBINE, COMBINED CYCLE	325 MW	BACT-PSD	2.00 PPM @ 15% O2	
CA-1096	VERNON CITY LIGHT & POWER	LOS ANGELES	CA	5/27/2003	GAS TURBINE: COMBINED CYCLE < 50 MW	43 MW GAS TURBINE, 55 MW STEAM TURBINE	BACT-PSD	2.00 PPM @ 15% O2	
CA-1097	MAGNOLIA POWER PROJECT, SCPPA	LOS ANGELES	CA	5/27/2003	GAS TURBINE: COMBINED CYCLE >= 50 MW	181 NET MW (GAS TURBINE W/STEAM INJECTION)	BACT-PSD	2.00 PPM @ 15% O2	
WA-0315	SUMAS ENERGY 2 GENERATION FACILITY	WHATCOM	WA	4/17/2003	TURBINES, COMBINED CYCLE, (2)	660 MW	BACT-PSD	2.00 PPM @ 15% O2	
GA-0105	MCINTOSH COMBINED CYCLE FACILITY	EFFINGHAM	GA	4/17/2003	TURBINE, COMBINED CYCLE, NATURAL GAS, (4)	140 MW	BACT-PSD	2.00 PPM @ 15% O2	
WA-0291	WALLULA POWER PLANT	WALLA WALLA	WA	1/3/2003	TURBINE, COMBINED CYCLE, NATURAL GAS (4)	1300 MW	Other Case-by-Case	2.00 PPM @ 15% O2	
OH-0248	LAWRENCE ENERGY	LAWRENCE	OH	9/24/2002	TURBINES (3), COMBINED CYCLE, DUCT BURNERS OFF	180 MW	BACT-PSD	2.00 PPM @ 15% O2	
WA-0299	SUMAS ENERGY 2 GENERATION FACILITY	WHATCOM	WA	9/6/2002	TURBINES, COMBINED CYCLE, (2)	334.5 MW	BACT-PSD	2.00 PPM @ 15% O2	
MT-0019	CONTINENTAL ENERGY SERVICES, INC., SILVER BOW GEN	SILVER BOW	MT	6/7/2002	TURBINE, COMBINED CYCLE 1	500 MW	Other Case-by-Case	2.00 PPM	1-HR AVG @ 15% O2

Table C-2 Gas Turbine CO Emission Limits from EPA'S RACT/BACT/LAER Clearing House (December 2009)

RBLCID	FACILITY NAME	COUNTY	STATE	PERMIT DATE	PROCESS NAME	Size	CASE-BY-CASE BASIS	Emission Limit	
MT-0019	CONTINENTAL ENERGY SERVICES, INC., SILVER BOW GEN	SILVER BOW	MT	6/7/2002	TURBINE, COMBINED CYCLE 2	500 MW	Other Case-by-Case	2.00 PPMVD	@ 15% O2, 24-HR ROLLING AVG
NJ-0043	LIBERTY GENERATING STATION	UNION	NJ	3/28/2002	COMBINED CYCLE TURBINE WITH DUCT BURNER	3202 MMBTU/H	Other Case-by-Case	2.00 PPMVD @ 15% O2	
NJ-0043	LIBERTY GENERATING STATION	UNION	NJ	3/28/2002	COMBINED CYCLE TURBINE (3)	2964 MMBTU/H	Other Case-by-Case	2.00 PPMVD @ 15% O2	
GA-0102	WANSLEY COMBINED CYCLE ENERGY FACILITY	HEARD	GA	1/15/2002	TURBINE, COMBINED CYCLE, (2)	167 MW	BACT-PSD	2.00 PPM @ 15% O2	
GA-0093	AUGUSTA ENERGY CENTER	RICHMOND	GA	10/28/2001	TURBINE, COMBINED CYCLE, (3)	750 MW	BACT-PSD	2.00 PPM @ 15% O2	
ID-0010	MIDDLETON FACILITY	CANYON	ID	10/19/2001	(2) GAS TURBINES WITHOUT DUCT BURNERS, NAT GAS		BACT-PSD	2.00 PPM @ 15% O2	EA, CONSECUTIVE 12 MO AV
ID-0010	MIDDLETON FACILITY	CANYON	ID	10/19/2001	(2) GAS TURBINES WITH DUCT BURNERS, NAT GAS	2097 MMBTU/H	BACT-PSD	2.00 PPM @ 15% O2	EA, CONSECUTIVE 12 MO AV
WA-0288	LONGVIEW ENERGY DEVELOPMENT	COWLITZ	WA	9/4/2001	COMBUSTION TURBINE, COMBINEDCYCLE (NG)	290 MW	Other Case-by-Case	2.00 PPM @ 15% O2	365 DAY AVG
NJ-0058	PSEG FOSSIL LLC LINDEN GENERATING STATION	UNION	NJ	8/24/2001	COMBUSTION GAS TURBINES(GE 7FA)(4 UNITS): COMBINED CYCLE	1651 MMBTU/H	BACT-PSD	2.00 PPM @ 15% O2	
NJ-0059	COGEN TECHNOLOGIES LINDEN VENTURE, L.P	UNION	NJ	5/9/2001	COMBUSTION GAS TURBINE(GE): COMBINED CYCLE(THE 6TH UNIT)	1928.2 MMBTU/H	Other Case-by-Case	2.00 PPM @ 15% O2	
NC-0085	CP&L ROWAN CO TURBINE FACILITY	ROWAN	NC	3/14/2001	TURBINE, COMBINED CYCLE, NATURAL GAS, (2)	157 MW	BACT-PSD	2.00 PPMVD	@ 15% O2, 24-HR ROLLING AVG
WA-0302	GOLDENDALE ENERGY PROJECT	KLICKITAT	WA	2/23/2001	COMBINED CYCLE UNIT (TURBINE/HRSG)	248.7 MW	BACT-PSD	2.00 PPM @ 15% O2	1-H AV, EXCEPT STARTUP
NV-0034	LAS VEGAS COGENERATION FACILITY	CLARK	NV	11/13/2000	TURBINE, COMBINED CYCLE	176 MW	BACT-PSD	2.00 PPM @ 15% O2	
CA-1050	IDC BELLINGHAM, LLC		CA	9/11/2000	GAS TURBINE: COMBINED CYCLE >= 50 MW	0 GAS TURBINE, 170 MW; STEAM TURBINE 185 MW	BACT-PSD	2.00 PPM @ 15% O2	
MA-0027	CABOT POWER CORPORATION	SUFFOLK	MA	5/7/2000	TURBINE, COMBINED CYCLE, NATURAL GAS	2493 MMBTU/H	BACT-PSD	2.00 PPM @ 15% O2	
MA-0029	SITHE MYSTIC DEVELOPMENT LLC	SUFFOLK	MA	9/29/1999	TURBINE, COMBINED CYCLE, NATURAL GAS (2)	2699 MMBTU/H	BACT-PSD	2.00 PPM @15% O2	
NJ-0044	MANTUA CREEK GENERATING FACILITY	GLOUCESTER	NJ	6/26/2001	COMBUSTION TURBINE WITHOUT DUCT BURNER		N/A	2.34 PPMVD @ 15% O2	
NJ-0044	MANTUA CREEK GENERATING FACILITY	GLOUCESTER	NJ	6/26/2001	COMBUSTION TURBINE WITHOUT DUCT BURNER, 75% LOAD		N/A	2.42 PPMVD @ 15% O2	
MS-0051	LSP- BATESVILLE GENERATION FACILITY	PANOLA	MS	11/13/2001	COMBINED CYCLE COMBUSTION TURBINE GENERATION (CTG)	2100 MMBTU/H	BACT-PSD	2.50 %PPM @15% O2	
NJ-0044	MANTUA CREEK GENERATING FACILITY	GLOUCESTER	NJ	6/26/2001	COMBUSTION TURBINE WITHOUT DUCT BURNER, 60% LOAD		N/A	2.51 PPMVD @ 15% O2	
AZ-0037	PANDA GILA RIVER	MARICOPA	AZ	2/23/2001	TURBINE, COMBINED CYCLE, DUCT BURNER	170 MW	BACT-PSD	2.80 PPM @ 15% O2	

Table C-2 Gas Turbine CO Emission Limits from EPA'S RACT/BACT/LAER Clearing House (December 2009)

RBLCID	FACILITY NAME	COUNTY	STATE	PERMIT DATE	PROCESS NAME	Size	CASE-BY-CASE BASIS	Emission Limit	
CO-0056	ROCKY MOUNTAIN ENERGY CENTER, LLC	WELD	CO	5/2/2006	NATURAL-GAS FIRED, COMBINED-CYCLE TURBINE	300 MW	BACT-PSD	3.00 PPM @ 15 O2	
AZ-0047	WELLTON MOHAWK GENERATING STATION	YUMA	AZ	12/1/2004	COMBUSTION TURBINE GENERATORS AND HEAT RECOVERY STEAM GENERATORS - SW501F TURBINES OPTION	180 MW	BACT-PSD	3.00 PPM @ 15% O2	
AZ-0047	WELLTON MOHAWK GENERATING STATION	YUMA	AZ	12/1/2004	COMBUSTION TURBINE GENERATORS AND HEAT RECOVERY STEAM GENERATORS - GE7FA TURBINES OPTION	170 MW	BACT-PSD	3.00 PPM @ 15% O2	
UT-0066	CURRANT CREEK	JUAB	UT	5/17/2004	NATURAL GAS FIRED TURBINES AND HEAT RECOVERY STEAM GENERATORS		BACT-PSD	3.00 PPM @ 15% O2	3-H COMBINED CYCLE AV
NV-0037	COPPER MOUNTAIN POWER	CLARK	NV	5/14/2004	LARGE COMBUSTION TURBINES, COMBINED CYCLE & COGENERATION	600 MW	LAER	3.00 PPM @ 15% O2	
AZ-0043	DUKE ENERGY ARLINGTON VALLEY (AVEFII)	MARICOPA	AZ	11/12/2003	TURBINE, COMBINED CYCLE & DUCT BURNER	325 MW	BACT-PSD	3.00 PPM @ 15% O2	
AZ-0049	LA PAZ GENERATING FACILITY	LA PAZ	AZ	9/4/2003	SIEMENS WESTINGHOUSE COMBUSTION TURBINES AND HEAT RECOVERY STEAM GENERATORS	1080 MW	BACT-PSD	3.00 PPM @ 15% O2	THREE HOUR AVERAGE AT 15% OXYGEN
AZ-0049	LA PAZ GENERATING FACILITY	LA PAZ	AZ	9/4/2003	GE COMBUSTION TURBINES AND HEAT RECOVERY STEAM GENERATORS	1040 MW	BACT-PSD	3.00 PPM @ 15% O2	3-HOUR AVERAGE AT 15% OXYGEN
PA-0188	FAIRLESS ENERGY LLC	BUCKS	PA	3/28/2002	TURBINE, COMBINED CYCLE	1190 MW	BACT-PSD	3.00 PPM @ 15% O2	
MD-0033	KELSON RIDGE	CHARLES	MD	9/27/2001	COMBINED CYCLE COMBUSTION TURBINE W/ HRSG & DUCT	180 MW	BACT-PSD	3.00 PPM @ 15% O2	
PA-0196	SWEC-FALLS TOWNSHIP	BUCKS	PA	8/7/2001	TURBINE, COMBINED CYCLE, NATURAL GAS	544 MW	LAER	3.00 PPM@15% O2	
MI-0267	RENAISSANCE POWER LLC	MONTCALM	MI	6/7/2001	TURBINES, STATIONARY GAS, COMBINED CYCLE, 3 EACH	170 MW	BACT-PSD	3.00 PPM @ 15% O2	
MA-0025	ANP BELLINGHAM ENERGY COMPANY	NORFOLK	MA	8/4/1999	TURBINES, COMBINED CYCLE, NATURAL GAS, (2)	3630 MMBTU/H	BACT-PSD	3.00 PPM @ 15% O2	
MA-0024	ANP BLACKSTONE ENERGY COMPANY	WORCESTER	MA	4/16/1999	TURBINE, COMBINED CYCLE, NATURAL GAS, (2)	3630 MMBTU/H	BACT-PSD	3.00 PPM @ 15% O2	
MI-0244	WYANDOTTE ENERGY		MI	2/8/1999	TURBINE, COMBINED CYCLE, POWER PLANT	500 MW	LAER	3.00 PPM @ 15% O2	
VA-0261	CPV CUNNINGHAM CREEK	FLUVANNA	VA	9/6/2002	TURBINE, COMBINED CYCLE, (2)	2132 MMBTU/H	BACT-PSD	3.10 PPM @ 15% O2	70-100% LOAD
NJ-0044	MANTUA CREEK GENERATING FACILITY	GLOUCESTER	NJ	6/26/2001	COMBUSTION TURBINE WITH DUCT BURNER (3)	2181 MMBTU/H	N/A	3.10 PPMVD @ 15% O2	
NV-0035	TRACY SUBSTATION EXPANSION PROJECT	STOREY COUNTY	NV	8/16/2005	TURBINE, COMBINED CYCLE COMBUSTION #1 WITH HRSG AND DUCT BURNER.	306 MW	BACT-PSD	3.50 PPM @ 15% O2	
NV-0035	TRACY SUBSTATION EXPANSION PROJECT	STOREY COUNTY	NV	8/16/2005	TURBINE, COMBINED CYCLE COMBUSTION #2 WITH HRSG AND DUCT BURNER.	306 MW	BACT-PSD	3.50 PPM @ 15% O2	
NV-0033	EL DORADO ENERGY, LLC	CLARK	NV	8/19/2004	COMBUSTION TURBINE, COMBINED CYCLE & COGEN(2)	475 MW	LAER	3.50 PPM @ 15% O2	
NC-0086	FAYETTEVILLE GENERATION, LLC	CUMBERLAND	NC	1/10/2002	TURBINE, COMBINED CYCLE, NATURAL GAS, (2)	154 MW	BACT-PSD	3.50 PPMVD @ 15% O2	
FL-0252	FORT PIERCE REPOWERING	ST LUCIE	FL	8/15/2001	TURBINE, COMBINED CYCLE, NATURAL GAS	180 MW	BACT-PSD	3.50 PPM @ 15% O2	

Table C-2 Gas Turbine CO Emission Limits from EPA'S RACT/BACT/LAER Clearing House (December 2009)

RBLCID	FACILITY NAME	COUNTY	STATE	PERMIT DATE	PROCESS NAME	Size	CASE-BY-CASE BASIS	Emission Limit	
NC-0082	CAROLINA POWER AND LIGHT - RICHMOND CO. FACILITY	RICHMOND	NC	12/21/2000	TURBINES, COMBINED CYCLE, NATURAL GAS, (2)	157 MW	BACT-PSD	3.50 PPMVD @ 15% O2	
MI-0302	MIRANT WYANDOTTE LLC	WAYNE	MI	7/25/2001	GAS TURBINES, COMBINED CYCLE, 2 EACH	2205 MMBTU/H	BACT-PSD	3.60 PPM @ 15% O2	
MI-0365	MIRANT WYANDOTTE LLC	WAYNE	MI	1/28/2003	TURBINE, COMBINED CYCLE, (2)	2200 MMBTU/H	BACT-PSD	3.80 PPM @ 15% O2	
AZ-0041	KYRENE GENERATING STATION, SALT RIVER PROJECT	MARICOPA	AZ	3/14/2001	TURBINE, COMBINED CYCLE, DUCT BURNER, NAT GAS	175 MW	LAER	3.90 PPM @ 15% O2	3 H avg
CA-1144	BLYTHE ENERGY PROJECT II	RIVERSIDE	CA	4/25/2007	2 COMBUSTION TURBINES	170 MW	BACT-PSD	4 PPMVD	AT 15% O2, 3-HR AVG
LA-0192	CRESCENT CITY POWER	ORLEANS	LA	6/6/2005	GAS TURBINES - 187 MW (2)	2006 MMBTU/H	BACT-PSD	4.00 PPM @ 15%O2	ANNUAL AVERAGE
NV-0038	IVANPAH ENERGY CENTER, L.P.	CLARK	NV	12/29/2003	LARGE COMBUSTION TURBINES, COMBINED CYCLE & COGENERATION	500 MW	LAER	4.00 PPM @ 15% O2	15% OXYGEN, ONE HOUR AVERAGE
MN-0054	MANKATO ENERGY CENTER	BLUE EARTH	MN	12/4/2003	COMBUSTION TURBINE, LARGE, 2 EACH	1916 MMBTU/H	BACT-PSD	4.00 PPM @ 15% O2	
CA-0997	SACRAMENTO MUNICIPAL UTILITY DISTRICT	SACRAMENTO COUNTY	CA	9/1/2003	GAS TURBINES, (2)	1611 MMBTU/H	LAER	4.00 PPM @ 15% O2	
MI-0361	SOUTH SHORE POWER LLC	BERRIEN	MI	1/30/2003	TURBINE, COMBINED CYCLE, (2)	172 MW	BACT-PSD	4.00 PPM @ 15% O2	
AZ-0038	GILA BEND POWER GENERATING STATION	MARICOPA	AZ	5/15/2002	TURBINE, COMBINED CYCLE, DUCT BURNER, NATURAL GAS	170 MW	BACT-PSD	4.00 PPM @ 15% O2	
AZ-0033	MESQUITE GENERATING STATION	MARICOPA	AZ	3/22/2001	TURBINE, COMBINED CYCLE, NATURAL GAS	1923 MMBTU/H	BACT-PSD	4.00 PPM @ 15% O2	
WI-0174	BADGER GENERATING CO LLC	KENOSHA	WI	9/20/2000	COMBUSTION TURBINE, COMBINED CYCLE (4)	2010 MMBTU/H	BACT-PSD	4.00 PPM @ 15% O2	75% Load
MN-0054	MANKATO ENERGY CENTER	BLUE EARTH	MN	12/4/2003	COMBUSTION TURBINE, LARGE 2 EACH	1827 MMBTU/H	BACT-PSD	4.80 PPM @ 15% O2	
OR-0035	PORT WESTWARD PLANT	COLUMBIA	OR	1/16/2002	(2) COMBUSTION TURBINES, WITH DUCT BURNER	325 MW, EACH	BACT-PSD	4.90 PPM @ 15% O2	8 H AV, EACH
OR-0040	KLAMATH GENERATION, LLC	KLAMATH	OR	3/12/2003	TURBINE, COMBINED CYCLE, DUCT BURNER, NAT GAS (2)	480 MW	BACT-PSD	5.00 PPM @ 15% O2	
MI-0357	KALKASKA GENERATING, INC	KALKASKA	MI	2/4/2003	TURBINE, COMBINED CYCLE, (2)	605 MW	BACT-PSD	5.00 PPM @ 15% O2	
PA-0223	DUKE ENERGY FAYETTE, LLC	FAYETTE	PA	1/30/2002	TURBINE, COMBINED CYCLE, (2)	280 MW	BACT-PSD	5.00 PPM @ 15% O2	
ID-0012	GARNET ENERGY, MIDDLETON FACILITY	CANYON	ID	10/19/2001	TURBINE, COMBINED CYCLE, NATURAL GAS, (2)	1707 MMBTU/H	BACT-PSD	5.00 PPM @ 15% O2	1 HOUR AVERAGE
OH-0263	FREMONT ENERGY CENTER, LLC	SANDUSKY	OH	8/9/2001	COMBUSTION TURBINES(2), COMB CYCLE W/O DUCT BURNER	180 MW	BACT-PSD	5.00 PPM @ 15% O2	
TX-0372	WEST TEXAS ENERGY FACILITY	EL PASO	TX	7/28/2000	(2) GAS TURBINE, NO POWER AUGMENTATION, CASE I	250 MW, EA	BACT-PSD	5.00 PPM @ 15% O2	EACH
TX-0325	MIDLOTHIAN ENERGY PROJECT	ELLIS	TX	5/9/2000	(4) GAS FUELED TURBINES, STACK 1-4	275 MW	BACT-PSD	5.00 PPM @ 15% O2	AT FULL LOAD
TX-0325	MIDLOTHIAN ENERGY PROJECT	ELLIS	TX	5/9/2000	(2) NEW TURBINES, STACK 5 & 6	250 MW	BACT-PSD	5.00 PPM @ 15% O2	
TX-0248	CHAMBERS ENERGY L.P./AMERICAN NATIONAL POWER	HARRIS	TX	3/6/2000	COGENERATION UNITS	180 MW	BACT-PSD	5.00 PPM @ 15% O2	
TX-0409	HAYS ENERGY PROJECT	HAYS	TX	6/8/1999	TURBINE, COMBINED CYCLE, NATURAL GAS, (4)	175 MW	BACT-PSD	5.00 PPM @ 15% O2	

Table C-2 Gas Turbine CO Emission Limits from EPA'S RACT/BACT/LAER Clearing House (December 2009)

RBLCID	FACILITY NAME	COUNTY	STATE	PERMIT DATE	PROCESS NAME	Size	CASE-BY-CASE BASIS	Emission Limit	
IA-0058	GREATER DES MOINES ENERGY CENTER	POLK	IA	4/10/2002	COMBUSTION TURBINES - COMBINED CYCLE	350 MW	Other Case-by-Case	5.40 PPM @ 15% O2	Calculated
FL-0304	CANE ISLAND POWER PARK	OSCEOLA	FL	9/8/2008	300 MW COMBINED CYCLE COMBUSTION TURBINE	1860 MMBTU/H	BACT-PSD	6 PPMVD	12-MONTH
OH-0252	DUKE ENERGY HANGING ROCK ENERGY FACILITY	LAWRENCE	OH	12/28/2004	TURBINES (4) (MODEL GE 7FA), DUCT BURNERS OFF	172 MW	BACT-PSD	6.00 PPM @ 15% O2	24-HR AVERAGE
CA-1142	PASTORIA ENERGY FACILITY	KERN	CA	12/23/2004	3 COMBUSTION TURBINES	168 MW	BACT-PSD	6 PPMVD	@ 15% O2, 3-HR ROLLING AVG
IN-0095	ALLEGHENY ENERGY SUPPLY CO. LLC	ST. JOSEPH	IN	12/7/2001	2 CMBND CYCLE COMBUST. TURBINE WESTINGHOUSE 501F	2071 MMBTU/H (HHV)	BACT-PSD	6.00 PPM @15% O2	
PA-0192	LOWER MOUNT BETHEL ENERGY, LLC	NORTHHAMPTON	PA	10/20/2001	TURBINE, COMBINED CYCLE, (2)	370 MW	LAER	6.00 PPM @ 15% O2	
OH-0265	DRESDEN ENERGY LLC	MUSKINGUM	OH	10/16/2001	COMBUSTION TURBINE (2), COMB. CYCLE W/O DUCT BURN	171.7 MW	BACT-PSD	6.00 PPM @ 15% O2	
IN-0110	COGENTRIX LAWRENCE CO., LLC	LAWRENCE	IN	10/5/2001	TURBINES, COMBINED CYCLE, (3)	1944.1 MMBTU/H	BACT-PSD	6.00 PPM @ 15% O2	
IN-0085	PSEG LAWRENCEBURG ENERGY FACILITY	DEARBORN	IN	6/7/2001	TURBINE, NATURAL GAS, COMBINED CYCLE FOUR	476.6 MMBTU/H	BACT-PSD	6.00 PPMDV @ 15% O2	
CA-0949	MOUNTAINVIEW POWER	SAN BERNARDINO	CA	5/22/2001	TURBINE, COMBINED CYCLE, NATURAL GAS, (4)	175.7 MW	LAER	6.00 PPM @ 15% O2	
AZ-0040	APS WEST PHOENIX	MARICOPA	AZ	5/26/2000	TURBINE, COMBINED CYCLE, DUCT BURNER, NAT GAS, CC4	130 MW	LAER	6.00 PPM @ 15% O2	
AZ-0040	APS WEST PHOENIX	MARICOPA	AZ	5/26/2000	TURBINE, COMBINED CYCLE, DUCT BURNER, NAT GAS, CC5	530 MW	LAER	6.00 PPM @ 15% O2	
CA-0950	VALERO REFINING COMPANY	SOLANO COUNTY	CA	1/11/2000	COMBUSTION TURBINE, COMBINED CYCLE, (2)	102 MW	LAER	6.00 PPM @ 15% O2	
AR-0041	TPS - DELL, LLC	MISSISSIPPI	AR	8/8/2000	TURBINE, NATURAL GAS FIRED 2	640 MW	BACT-PSD	7.00 PPM @ 15% O2	
TX-0406	EASTEX COGENERATION STATION	HARRISON	TX	11/19/1999	TURBINE WITH DUCT BURNERS, (2)		BACT-PSD	7.00 PPM @ 15% O2	
FL-0245	FPL MANATEE PLANT - UNIT 3	MANATEE	FL	4/15/2003	TURBINE, COMBINED CYCLE, NATURAL GAS (4)	170 MW	BACT-PSD	7.40 PPM @ 15% O2	
FL-0226	EL PASO MANATEE ENERGY CENTER	MANATEE	FL	9/11/2001	TURBINE, COMBINED CYCLE, NAT. GAS	1.79 MMCF/H	BACT-PSD	7.40 PPM @ 15% O2	
FL-0227	EL PASO BELLE GLADE ENERGY CENTER	PALM BEACH	FL	9/7/2001	TURBINE, COMBINED CYCLE, NAT. GAS	1.79 MMCF/H	BACT-PSD	7.40 PPM @ 15% O2	
FL-0225	EL PASO BROWARD ENERGY CENTER	BROWARD	FL	8/17/2001	TURBINE, COMBINED CYCLE, NAT. GAS	1.79 MMCF/H	BACT-PSD	7.40 PPM @ 15% O2	
FL-0263	FPL TURKEY POINT POWER PLANT	DADE	FL	2/8/2005	170 MW COMBUSTION TURBINE, 4 UNITS	170 MW	BACT-PSD	7.60 PPM @ 15 % O2	STACK TEST (CT & DUCT BURNER)
FL-0247	TECO BAYSIDE POWER STATION	HILLSBOROUGH	FL	1/8/2002	TURBINE, COMBINED CYCLE, (11)	170 MW	BACT-PSD	7.80 PPM @ 15% O2	
FL-0246	TECO BAYSIDE POWER STATION	HILLSBOROUGH	FL	3/30/2001	TURBINE, COMBINED CYCLE, NATURAL GAS, (7)	170 MW	BACT-PSD	7.80 PPM @ 15% O2	
OK-0050	ONETA GENERATING STA	WAGONER	OK	1/21/2000	COMBUSTION TURBINES, COMBINED CYCLE (4)	170 MW	BACT-PSD	7.80 PPM @ 15% O2	
FL-0285	PROGRESS BARTOW POWER PLANT	PINELLAS	FL	1/26/2007	COMBINED CYCLE COMBUSTION TURBINE SYSTEM (4-ON-1)	1972 MMBTU/H	BACT-PSD	8 PPMVD	24-HR BLOCK AVERAGE CEMS

Table C-2 Gas Turbine CO Emission Limits from EPA'S RACT/BACT/LAER Clearing House (December 2009)

RBLCID	FACILITY NAME	COUNTY	STATE	PERMIT DATE	PROCESS NAME	Size	CASE-BY-CASE BASIS	Emission Limit
FL-0286	FPL WEST COUNTY ENERGY CENTER	PALM BEACH	FL	1/10/2007	COMBINED CYCLE COMBUSTION GAS TURBINES - 6 UNITS	2333 MMBTU/H	BACT-PSD	8 PPMVD @15%O2 24-HR
FL-0265	HINES POWER BLOCK 4	POLK	FL	6/8/2005	COMBINED CYCLE TURBINE	530 MW	BACT-PSD	8.00 PPM @ 15% O2
MI-0363	BLUEWATER ENERGY CENTER LLC	ST. CLAIR	MI	1/7/2003	TURBINE, COMBINED CYCLE, (3)	180 MW	BACT-PSD	8.00 PPM @ 15% O2
VA-0260	HENRY COUNTY POWER	HENRY	VA	11/21/2002	TURBINE, COMBINED CYCLE, (4), 100% LOAD	171 MW	BACT-PSD	8.00 PPM @ 15% O2
VA-0260	HENRY COUNTY POWER	HENRY	VA	11/21/2002	TURBINE, COMBINED CYCLE, (4), 70% LOAD	171 MW	BACT-PSD	8.00 PPM @ 15% O2
FL-0241	CPV CANA	ST LUCIE COUNTY	FL	1/17/2002	TURBINE, COMBINED CYCLE, NATURAL GAS	1680 MMBTU/H	BACT-PSD	8.00 PPM @ 15% O2
FL-0240	CPV PIERCE	POLK	FL	8/7/2001	TURBINE, COMBINED CYCLE, NATURAL GAS	1680 MMBTU/H	BACT-PSD	8.00 PPM @ 15% O2
AR-0070	GENOVA ARKANSAS I, LLC	WASHINGTON	AR	8/23/2002	TURBINE, COMBINED CYCLE, (2), (GE)	170 MW	BACT-PSD	8.20 PPM @ 15% O2
OK-0070	GENOVA OK I POWER PROJECT	GRADY	OK	6/13/2002	GE COMBUSTION TURBINE & DUCT BURNERS	1705 MMBTU/H	BACT-PSD	8.20 PPM @ 15% O2
WV-0014	PANDA CULLODEN GENERATING STATION	CABELL	WV	12/18/2001	COMBUSTION TURBINE, 300 MW	300 MW	BACT-PSD	8.20 PPM @ 15% O2
OH-0252	DUKE ENERGY HANGING ROCK ENERGY FACILITY	LAWRENCE	OH	12/28/2004	TURBINES (4) (MODEL GE 7FA), DUCT BURNERS ON	172 MW	BACT-PSD	9.00 PPM @ 15% O2 24-HR AVERAGE
VA-0289	DUKE ENERGY WYTHE, LLC	WYTHE	VA	2/5/2004	TURBINE, COMBINED CYCLE, NATURAL GAS	170 MW	BACT-PSD	9.00 PPM @ 15% O2
VA-0287	JAMES CITY ENERGY PARK	JAMES CITY	VA	12/1/2003	TURBINE, COMBINED CYCLE, NATURAL GAS	1973 MMBTU/H	BACT-PSD	9.00 PPM @ 15% O2
VA-0255	VA POWER - POSSUM POINT	PRINCE WILLIAM	VA	11/18/2002	TURBINE, NATURAL GAS, NO DUCT BURNER FIRING	1937 MMBTU/H	BACT-PSD	9.00 PPM @ 15% O2 EACH UNIT
CO-0052	ROCKY MOUNTAIN ENERGY CENTER, LLC.	WELD	CO	8/11/2002	TWO (2) NATURAL GAS FIRED, COMBINED-CYCLE, TURBINE	2311 MMBTU/H	BACT-PSD	9.00 PPM @ 15% O2
IN-0114	MIRANT SUGAR CREEK LLC	VIGO	IN	7/24/2002	TURBINE, COMBINED CYCLE, NATURAL GAS (4)	1490.5 MMBTU/H	BACT-PSD	9.00 PPM @ 15% O2
NC-0095	MIRANT GASTONIA POWER FACILITY	GASTON	NC	5/28/2002	TURBINES, COMBINED CYCLE, GE	175 MW	BACT-PSD	9.00 PPM @ 15% O2
NC-0094	GENPOWER EARLEYS, LLC	HERTFORD	NC	1/9/2002	TURBINES, COMBINED CYCLE, NATURAL GAS (2)	1715 MMBTU/H	BACT-PSD	9.00 PPM @ 15% O2
GA-0094	EFFINGHAM COUNTY POWER, LLC	EFFINGHAM	GA	12/27/2001	TURBINE, COMBINED CYCLE, (2)	185 MW	BACT-PSD	9.00 PPM @ 15% O2
OH-0257	JACKSON COUNTY POWER, LLC	JACKSON	OH	12/27/2001	COMBUSTION TURBINES, COMBINED CYCLE, (4)	305 MW	BACT-PSD	9.00 PPM @ 15% O2
IN-0110	COGENTRIX LAWRENCE CO., LLC	LAWRENCE	IN	10/5/2001	TURBINES, COMBINED CYCLE, & DUCT BURNERS, (3)	1944.1 MMBTU/H	BACT-PSD	9.00 PPM @ 15% O2
OK-0044	SMITH POCOLA ENERGY PROJECT	OKLAHOMA	OK	8/16/2001	TURBINES, NATURAL GAS, (4)	171.5 MW	BACT-PSD	9.00 PPM @ 15% O2
IN-0087	DUKE ENERGY, VIGO LLC	VIGO	IN	6/6/2001	TURBINE, NATURAL GAS, COMBINED CYCLE (2)	170 MW	BACT-PSD	9.00 PPM @ 15% O2
IN-0086	MIRANT SUGAR CREEK, LLC	VIGO	IN	5/9/2001	TURBINE, NATURAL GAS, COMBINED CYCLE	170 MW	BACT-PSD	9.00 PPM @ 15% O2
FL-0219	CPV ATLANTIC POWER GENERATING FACILITY	ST. LUCIE COUNTY	FL	5/3/2001	COMBINED CYCLE COMBUSTION TURBINE, NOMINAL 245 MW	1700 MMBTU/H	BACT-PSD	9.00 PPM @ 15% O2

Table C-2 Gas Turbine CO Emission Limits from EPA'S RACT/BACT/LAER Clearing House (December 2009)

RBLCID	FACILITY NAME	COUNTY	STATE	PERMIT DATE	PROCESS NAME	Size	CASE-BY-CASE BASIS	Emission Limit	
OH-0255	AEP WATERFORD ENERGY LLC	WASHINGTON	OH	3/29/2001	TURBINES (3), COMBINED CYCLE, W/O DUCT FIRING	170 MW	BACT-PSD	9.00 PPM @ 15% O2	
DE-0016	HAY ROAD POWER COMPLEX UNITS 5-8	NEW CASTLE	DE	10/17/2000	TURBINES (3), POLLUTANTS OTHER THAN NOX	500 MW	BACT-PSD	9.00 PPM @ 15% O2	
IN-0092	WHITING CLEAN ENERGY, INC.	LAKE	IN	7/20/2000	TURBINES, COMBUSTION, NATURAL GAS (2)	1735 MMBTU/H	BACT-PSD	9.00 PPM @ 15% O2	
TX-0296	WISE COUNTY POWER	WISE	TX	7/14/2000	(2) COMBUSTION TURBINES, STACK 1 & 2	230 MW, EA	BACT-PSD	9.00 PPM @ 15% O2	YR AV, EXCEPT STARTUP/SHUTDOWN, EACH
SC-0066	SANTEE COOPER RAINEY GENERATION STATION	ANDERSON	SC	4/3/2000	TURBINES, COMBINED CYCLE, NATURAL GAS, (2)	170 MW	BACT-PSD	9.00 PPM @ 15% O2	
TX-0273	BASTROP CLEAN ENERGY CENTER	BASTROP	TX	3/21/2000	COMBUSTION TURBINE GENERATORS ONLY (2)	161 MW (68 F CASE) EACH	BACT-PSD	9.00 PPM @ 15% O2	
TX-0294	GATEWAY POWER PROJECT	UPSHUR	TX	3/20/2000	(3) COMBUSTION TURBINES, WITHOUT DB, CTG-1,-2,-3	180 MW, EACH	BACT-PSD	9.00 PPM @ 15% O2	W/O STEAM INJECTION, ASSUMED 15% O2
TX-0383	FORNEY PLANT	KAUFMAN	TX	3/6/2000	(6) TURBINES	169.8 MW	BACT-PSD	9.00 PPM @ 15% O2	EACH
TX-0262	ARCHER GENERATING STATION	ECTOR	TX	1/3/2000	TURBINES AND DUCT BURNERS TOTAL LIMITS	1000 MW (TURBINES)	BACT-PSD	9.00 PPM @ 15% O2	TURBINE
TX-0262	ARCHER GENERATING STATION	ECTOR	TX	1/3/2000	(4) GAS TURBINES, TURBINE ONLY FIRING (4)	170 MW EACH	BACT-PSD	9.00 PPM @ 15% O2	
TX-0262	ARCHER GENERATING STATION	ECTOR	TX	1/3/2000	GAS TURBINES (4) WITH HRSG (4) (COMBINED FIRING)	173 MW EACH	BACT-PSD	9.00 PPM @ 15% O2	EACH, COMBINED
TX-0370	RIO NOGALES POWER PROJECT	GUADALUPE	TX	12/3/1999	(3) TURBINES 1-3, NO HRSG, CTG1-3, HOURLY LIMITS	170 MW	BACT-PSD	9.00 PPM @ 15% O2	EACH, WITHOUT STEAM INJECTION
TX-0324	ODESSA-ECTOR GENERATING STATION	ECTOR	TX	11/18/1999	(4) TURBINE & DUCT BURNERS, GT-HRSG 1-4	1000 MW	BACT-PSD	9.00 PPM @ 15% O2	EACH UNIT
TX-0324	ODESSA-ECTOR GENERATING STATION	ECTOR	TX	11/18/1999	(4) TURBINES (ONLY), HR LIMITS ONLY, GT-HRSG 1-4	170 MW	BACT-PSD	9.00 PPM @ 15% O2	EACH UNIT
FL-0223	LAKE WORTH GENERATION, LLC	PALM BEACH	FL	11/4/1999	TURBINE, COMBINED CYCLE, NATURAL GAS	186 MW	BACT-PSD	9.00 PPM @ 15% O2	
LA-0224	ARSENAL HILL POWER PLANT	CADDO	LA	3/20/2008	TWO COMBINED CYCLE GAS TURBINES	2110 MMBTU/H	BACT-PSD	10.00 PPMVD@15%O2	ANNUAL AVERAGE
MN-0066	NORTHERN STATES POWER CO. DBA XCEL ENERGY - RIVERSIDE PLANT	RAMSEY	MN	5/16/2006	TURBINE, COMBINED CYCLE (2)	1885 mmbtu/h	BACT-PSD	10.00 PPM @ 15% O2	
MN-0053	FAIRBAULT ENERGY PARK	RICE	MN	7/15/2004	TURBINE, COMBINED CYCLE, NATURAL GAS (1)	1876 MMBTU/H	BACT-PSD	10.00 PPMVD @ 15% O2	3 HOUR AVERAGE
FL-0256	HINES ENERGY COMPLEX, POWER BLOCK 3	POLK	FL	9/8/2003	COMBUSTION TURBINES, COMBINED CYCLE, NATURAL GAS,2	1830 MMBTU/H	BACT-PSD	10.00 PPMVD @15% O2	
OH-0254	DUKE ENERGY WASHINGTON COUNTY LLC	WASHINGTON	OH	8/14/2003	TURBINES (2) (MODEL GE 7FA), DUCT BURNERS OFF	170 MW	BACT-PSD	10.00 PPM @ 15% O2	

Table C-2 Gas Turbine CO Emission Limits from EPA'S RACT/BACT/LAER Clearing House (December 2009)

RBLCID	FACILITY NAME	COUNTY	STATE	PERMIT DATE	PROCESS NAME	Size	CASE-BY-CASE BASIS	Emission Limit
FL-0244	FPL MARTIN PLANT	MARTIN COUNTY	FL	4/16/2003	TURBINE, COMBINED CYLE, NATURAL GAS, (4)	170 MW	BACT-PSD	10.00 PPM @ 15% O2
OK-0090	DUKE ENERGY STEPHENS, LLC STEPHENS ENERGY	STEPHENS	OK	3/21/2003	TURBINES, COMBINED CYCLE (2)	1701 MMBTU/H	BACT-PSD	10.00 PPM @ 15% O2
OH-0248	LAWRENCE ENERGY	LAWRENCE	OH	9/24/2002	TURBINES (3), COMBINED CYCLE, DUCT BURNERS ON	180 MW	BACT-PSD	10.00 PPM @ 15% O2
NM-0044	CLOVIS ENERGY FACILITY	CURRY	NM	6/27/2002	TURBINES, COMBINED CYCLE, NATURAL GAS (4)	1515 MMBTU/H	BACT-PSD	10.00 PPM @ 15% O2
NC-0095	MIRANT GASTONIA POWER FACILITY	GASTON	NC	5/28/2002	TURBINES, COMBINED CYCLE, MHI/SW	175 MW	BACT-PSD	10.00 PPM @ 15% O2
PA-0226	LIMERICK POWER STATION	MONTGOMERY	PA	4/9/2002	TURBINE, COMBINED CYCLE	550 MW	BACT-PSD	10.00 PPM @ 15% O2
AR-0052	THOMAS B. FITZHUGH GENERATING STATION	FRANKLIN	AR	2/15/2002	TURBINE, COMBINED CYCLE, NATURAL GAS	170.6 MW	BACT-PSD	10.00 PPM @ 15% O2
TX-0234	EDINBURG ENERGY LIMITED PARTNERSHIP	HIDALGO	TX	1/8/2002	(4) COMBINED CYCLE GAS TURBINE, ABB MODEL GT24	180 MW	BACT-PSD	10.00 PPM @15%O2
PA-0179	SWEC LLC	BUCKS	PA	8/7/2001	TURBINE, NATURAL GAS FIRED	0	Other Case-by-Case	10.00 PPM@15% O2
AZ-0034	HARQUAHALA GENERATING PROJECT	MARICOPA	AZ	2/15/2001	COMBINED CYCLE, NATURAL GAS	2362 MMBTU/H	Other Case-by-Case	10.00 PPM @ 15% O2
PA-0160	CALPINE CONSTRUCTION FINANCE CO., LP	BERKS	PA	10/10/2000	TURBINE, COMBINED CYCLE, NATURAL GAS	182 MW	Other Case-by-Case	10.00 PPM @ 15% O2
PA-0184	CALPINE BERKS ONTELAUNEE POWER PLANT	BERKS	PA	10/10/2000	TURBINES, COMBINED CYCLE, (2)	544 MW	LAER	10.00 PPM @15% O2
TX-0406	EASTEX COGENERATION STATION	HARRISON	TX	11/19/1999	TURBINE, COMBINED CYCLE, (2)	168 MW	BACT-PSD	10.00 PPM @ 15% O2

Table C-3 Gas Turbine VOC Emission Limits from EPA'S RACT/BACT/LAER Clearing House (December 2009)

RBLCID	FACILITY NAME	COUNTY	STATE	PERMIT DATE	PROCESS NAME	Size	CASE-BY-CASE BASIS	Emission Limit	
*OK-0129	CHOUTEAU POWER PLANT	MAYES	OK	1/23/2009	COMBINED CYCLE COGENERATION >25MW	1882 MMBTU/H	BACT-PSD	0.30 PPM	3-HR AVG @ 15% O2
TX-0248	CHAMBERS ENERGY L.P./AMERICAN NATIONAL POWER	HARRIS	TX	3/6/2000	COGENERATION UNITS	180 MW	LAER	0.40 PPMVD	
TX-0409	HAYS ENERGY PROJECT	HAYS	TX	6/8/1999	TURBINE, COMBINED CYCLE, NATURAL GAS, (4)	175 MW	BACT-PSD	0.40 PPMVD	
OK-0028	CHOUTEAU POWER PLANT	MAYES	OK	3/24/1999	COMBUSTION TURBINES (2), COMBINED CYCLE	176 MW	BACT-PSD	0.57 PPM @ 15% O2	
*VA-0308	WARREN COUNTY FACILITY	WARREN	VA	1/14/2008	ELECTRIC GENERATION - SCENARIO 2	1944 MMBTU	N/A	0.70 PPMVD	
*VA-0308	WARREN COUNTY FACILITY	WARREN	VA	1/14/2008	ELECTRIC GENERATION SECNARIO 3	2204 MMBTU/H	N/A	0.70 PPMVD	
*VA-0308	WARREN COUNTY FACILITY	WARREN	VA	1/14/2008	ELECTRIC GENERATION - SCENARIO 1	1717 MMBTU/H	N/A	0.70 PPMVD	WITHOUT DUCT BURNER
*VA-0291	CPV WARREN LLC	WARREN	VA	7/30/2004	TURBINE, COMBINED CYCLE (2)	1717 MMBTU/H	Other Case-by-Case	0.70 PPMVD	
NJ-0044	MANTUA CREEK GENERATING FACILITY	GLOUCESTER	NJ	6/26/2001	COMBUSTION TURBINE WITHOUT DUCT BURNER		N/A	0.73 PPMVD @ 15% O2	
NJ-0044	MANTUA CREEK GENERATING FACILITY	GLOUCESTER	NJ	6/26/2001	COMBUSTION TURBINE WITHOUT DUCT BURNER, 75% LOAD		N/A	0.75 PPMVD @ 15% O2	
NJ-0044	MANTUA CREEK GENERATING FACILITY	GLOUCESTER	NJ	6/26/2001	COMBUSTION TURBINE WITHOUT DUCT BURNER, 60% LOAD		N/A	0.78 PPMVD @ 15% O2	
NJ-0043	LIBERTY GENERATING STATION	UNION	NJ	3/28/2002	COMBINED CYCLE TURBINE (3)	2964 MMBTU/H	Other Case-by-Case	1.00 PPMVD @ 15% O2	
MN-0053	FAIRBAULT ENERGY PARK	RICE	MN	7/15/2004	TURBINE, COMBINED CYCLE, NATURAL GAS (1)	1876 MMBTU/H	BACT-PSD	1.00 PPMVD @ 15% O2	3 HOUR AVERAGE
NY-0100	EMPIRE POWER PLANT	RENSSELAER	NY	6/23/2005	FUEL COMBUSTION (NATURAL GAS)	2099 MMBTU/H	LAER	1.00 PPMVD AT 15% O2	AS PER EPA METHOD 25A
AZ-0043	DUKE ENERGY ARLINGTON VALLEY (AVEFII)	MARICOPA	AZ	11/12/2003	TURBINE, COMBINED CYCLE	325 MW	BACT-PSD	1.00 PPMVD @ 15% O2	
CA-1050	IDC BELLINGHAM, LLC		CA	9/11/2000	GAS TURBINE: COMBINED CYCLE >= 50 MW	GAS TURBINE, 170 0 MW; STEAM TURBINE 185 MW	BACT-PSD	1.00 PPMVD @ 15% O2	
NC-0095	MIRANT GASTONIA POWER FACILITY	GASTON	NC	5/28/2002	TURBINES, COMBINED CYCLE, MHI/SW	175 MW	BACT-PSD	1.00 PPMVD @ 15% O2	
TX-0406	EASTEX COGENERATION STATION	HARRISON	TX	11/19/1999	TURBINE, COMBINED CYCLE, (2)	168 MW	BACT-PSD	1.00 PPMVD @ 15% O2	
*GA-0127	PLANT MCDONOUGH COMBINED CYCLE	COBB	GA	1/7/2008	COMBINED CYCLE COMBUSTION TURBINE	254 MW	LAER	1.00 PPM @ 15% O2	3-HOUR, WITHOUT DUCT BURNER

Table C-3 Gas Turbine VOC Emission Limits from EPA'S RACT/BACT/LAER Clearing House (December 2009)

RBLCID	FACILITY NAME	COUNTY	STATE	PERMIT DATE	PROCESS NAME	Size	CASE-BY-CASE BASIS	Emission Limit	
MA-0027	CABOT POWER CORPORATION	SUFFOLK	MA	5/7/2000	TURBINE, COMBINED CYCLE, NATURAL GAS	2493 MMBTU/H	BACT-PSD	1.00 PPM @ 15% O2	
LA-0192	CRESCENT CITY POWER	ORLEANS	LA	6/6/2005	GAS TURBINES - 187 MW (2)	2006 MMBTU/H	BACT-PSD	1.10 PPM @ 15% O2	ANNUAL AVERAGE
WI-0174	BADGER GENERATING CO LLC	KENOSHA	WI	9/20/2000	COMBUSTION TURBINE, COMBINED CYCLE (4)	2010 MMBTU/H	LAER	1.20 PPM @ 15% O2	75% Load
OK-0050	ONETA GENERATING STA	WAGONER	OK	1/21/2000	COMBUSTION TURBINES, COMBINED CYCLE (4)	170 MW	BACT-PSD	1.20 PPM @ 15% O2	
NJ-0059	COGEN TECHNOLOGIES LINDEN VENTURE, L.P	UNION	NJ	5/9/2001	COMBUSTION GAS TURBINE(GE): COMBINED CYCLE(THE 6TH UNIT)	1928.2 MMBTU/H	Other Case-by-Case	1.20 PPMVD@15%O2	
VA-0255	VA POWER - POSSUM POINT	PRINCE WILLIAM	VA	11/18/2002	TURBINE, NATURAL GAS, NO DUCT BURNER FIRING	1937 MMBTU/H	BACT-PSD	1.20 PPMVD @ 15% O2	EACH UNIT
PA-0189	CONECTIV BETHLEHEM, INC.	NORTHAMPTON	PA	1/16/2002	TURBINE, COMBINED CYCLE, (6)	122 MW	Other Case-by-Case	1.20 PPMVD@15% O2	
TX-0324	ODESSA-ECTOR GENERATING STATION	ECTOR	TX	11/18/1999	(4) TURBINES (ONLY), HR LIMITS ONLY, GT-HRSG 1-4	170 MW	BACT-PSD	1.20 PPM @ 15% O2	EACH UNIT
NC-0095	MIRANT GASTONIA POWER FACILITY	GASTON	NC	5/28/2002	TURBINES, COMBINED CYCLE, GE	175 MW	BACT-PSD	1.30 PPM @ 15% O2	
FL-0244	FPL MARTIN PLANT	MARTIN COUNTY	FL	4/16/2003	TURBINE, COMBINED CYLE, NATURAL GAS, (4)	170 MW	BACT-PSD	1.30 PPMVD @ 15% O2	
FL-0245	FPL MANATEE PLANT - UNIT 3	MANATEE	FL	4/15/2003	TURBINE, COMBINED CYCLE, NATURAL GAS (4)	170 MW	Other Case-by-Case	1.30 PPMVD @ 15% O2	
FL-0246	TECO BAYSIDE POWER STATION	HILLSBOROUGH	FL	3/30/2001	TURBINE, COMBINED CYCLE, NATURAL GAS, (7)	170 MW	BACT-PSD	1.30 PPMVD @ 15% O2	
DE-0016	HAY ROAD POWER COMPLEX UNITS 5-8	NEW CASTLE	DE	10/17/2000	TURBINES (3), POLLUTANTS OTHER THAN NOX	500 MW	LAER	#REF! PPM @15% O2	
*VA-0308	WARREN COUNTY FACILITY	WARREN	VA	1/14/2008	ELECTRIC GENERATION - SCENARIO 1	1717 MMBTU/H	N/A	1.40 PPMVD	WITH DUCT BURNER AND POWER
*VA-0291	CPV WARREN LLC	WARREN	VA	7/30/2004	TURBINE, COMBINED CYCLE AND DUCT BURNER (2)	1717 MMBTU/H	Other Case-by-Case	1.40 PPMVD	DUCT BURNER AND POWER AUGMENTATION
FL-0219	CPV ATLANTIC POWER GENERATING FACILITY	ST. LUCIE COUNTY	FL	5/3/2001	COMBINED CYCLE COMBUSTION TURBINE, NOMINAL 245 MW	1700 MMBTU/H	Other Case-by-Case	1.40 PPM @ 15% O2	
WV-0014	PANDA CULLODEN GENERATING STATION	CABELL	WV	12/18/2001	COMBUSTION TURBINE, 300 MW	300 MW	BACT-PSD	1.40 PPM @ 15% O2	
FL-0225	EL PASO BROWARD ENERGY CENTER	BROWARD	FL	8/17/2001	TURBINE, COMBINED CYCLE, NAT. GAS	1.79 MMCF/H	Other Case-by-Case	1.40 PPM @ 15% O2	
FL-0226	EL PASO MANATEE ENERGY CENTER	MANATEE	FL	9/11/2001	TURBINE, COMBINED CYCLE, NAT. GAS	1.79 MMCF/H	Other Case-by-Case	1.40 PPM @ 15% O2	

Table C-3 Gas Turbine VOC Emission Limits from EPA'S RACT/BACT/LAER Clearing House (December 2009)

RBLCID	FACILITY NAME	COUNTY	STATE	PERMIT DATE	PROCESS NAME	Size	CASE-BY-CASE BASIS	Emission Limit	
FL-0227	EL PASO BELLE GLADE ENERGY CENTER	PALM BEACH	FL	9/7/2001	TURBINE, COMBINED CYCLE, NAT. GAS	1.79 MMCF/H	Other Case-by-Case	1.40 PPM @ 15% O2	
TX-0273	BASTROP CLEAN ENERGY CENTER	BASTROP	TX	3/21/2000	COMBUSTION TURBINE GENERATORS ONLY (2)	161 MW (68 F CASE) EACH	BACT-PSD	1.40 PPMVD @ 15% O2	
AZ-0035	DUKE ENERGY ARLINGTON VALLEY	MARICOPA	AZ	12/14/2000	TURBINE, COMBINED CYCLE	255 MW	BACT-PSD	1.40 PPM @ 15% O2	3 hr avg
TX-0294	GATEWAY POWER PROJECT	UPSHUR	TX	3/20/2000	(3) COMBUSTION TURBINES, WITHOUT DB, CTG-1,-2,-3	180 MW, EACH	BACT-PSD	1.40 PPMV	WET BASIS, EACH UNIT
TX-0260	PALESTINE ENERGY FACILITY	ANDERSON	TX	12/13/2000	TURBINES, COMBINED CYCLE,& HRSG, (6)	170 MW	BACT-PSD	1.40 PPM @ 15% O2	
CA-0997	SACRAMENTO MUNICIPAL UTILITY DISTRICT	SACRAMENTO COUNTY	CA	9/1/2003	GAS TURBINES, (2)	1611 MMBTU/H	LAER	1.40 PPM @ 15% O2	
AR-0070	GENOVA ARKANSAS I, LLC	WASHINGTON	AR	8/23/2002	TURBINE, COMBINED CYCLE, (2), (GE)	170 MW	BACT-PSD	1.40 PPM @ 15% O2	
AZ-0038	GILA BEND POWER GENERATING STATION	MARICOPA	AZ	5/15/2002	TURBINE, COMBINED CYCLE, DUCT BURNER, NATURAL GAS	170 MW	BACT-PSD	1.40 PPM @ 15% O2	
CA-0949	MOUNTAINVIEW POWER	SAN BERNARDINO	CA	5/22/2001	TURBINE, COMBINED CYCLE, NATURAL GAS, (4)	175.7 MW	LAER	1.40 PPM @ 15% O2	
FL-0122	CANE ISLAND POWER PARK /KUA - UNIT 3	OSCEOLA	FL	11/24/1999	TURBINE, COMBINED CYCLE, NATURAL GAS	1696 MMBTU/H	BACT-PSD	1.40 PPM @ 15% O2	
LA-0127	PERRYVILLE	OUACHITA PARISH	LA	8/25/2000	GAS TURBINES IN COMBINED CYCLE MODE, 4	183 MW	BACT-PSD	1.40 PPM @ 15% O2	
LA-0157	PERRYVILLE POWER STATION	OUACHITA PARISH	LA	3/8/2002	TURBINES, COMBINED CYCLE, GAS, (2) EPNS 1-1, 1-2	170 MW	BACT-PSD	1.40 PPM @ 15% O2	
VA-0287	JAMES CITY ENERGY PARK	JAMES CITY	VA	12/1/2003	TURBINE, COMBINED CYCLE, NATURAL GAS	1973 MMBTU/H	BACT-PSD	1.40 PPM @ 15% O2	
NC-0085	CP&L ROWAN CO TURBINE FACILITY	ROWAN	NC	3/14/2001	TURBINE, COMBINED CYCLE, NATURAL GAS, (2)	157 MW	BACT-PSD	1.40 PPM @ 15% O2	
NM-0044	CLOVIS ENERGY FACILITY	CURRY	NM	6/27/2002	TURBINES, COMBINED CYCLE, NATURAL GAS (4)	1515 MMBTU/H	BACT-PSD	1.40 PPMV WET	
FL-0162	FPL SANFORD PLANT	VOLUSIA	FL	9/14/1999	COMBUSTION TURBINES, COMBINED CYCLE (4)	1776 MMBTU/H	BACT-PSD	1.40 PPM @ 15% O2	
TX-0383	FORNEY PLANT	KAUFMAN	TX	3/6/2000	(6) TURBINES	169.8 MW	BACT-PSD	1.40 PPM @ 15% O2	EACH
MA-0024	ANP BLACKSTONE ENERGY COMPANY	WORCESTER	MA	4/16/1999	TURBINE, COMBINED CYCLE, NATURAL GAS, (2)	3630 MMBTU/H	BACT-PSD	1.40 PPM @ 15% O2	
MA-0025	ANP BELLINGHAM ENERGY COMPANY	NORFOLK	MA	8/4/1999	TURBINES, COMBINED CYCLE, NATURAL GAS, (2)	3630 MMBTU/H	LAER	1.40 PPM @ 15% O2	

Table C-3 Gas Turbine VOC Emission Limits from EPA'S RACT/BACT/LAER Clearing House (December 2009)

RBLCID	FACILITY NAME	COUNTY	STATE	PERMIT DATE	PROCESS NAME	Size	CASE-BY-CASE BASIS	Emission Limit	
OK-0070	GENOVA OK I POWER PROJECT	GRADY	OK	6/13/2002	GE COMBUSTION TURBINE & DUCT BURNERS	1705 MMBTU/H	BACT-PSD	1.40 PPM @ 15% O2	without duct burner
TX-0414	ATOFINA PETROCHEMICALS PORT ARTHUR COMPLEX	JEFFERSON	TX	4/22/1999	TURBINE, COMBINED CYCLE, W/ SCR, UNIT 2	39 MW	BACT-PSD	1.40 PPM @ 15% O2	
FL-0285	PROGRESS BARTOW POWER PLANT	PINELLAS	FL	1/26/2007	COMBINED CYCLE COMBUSTION TURBINE SYSTEM (4-ON-1)	1972 MMBTU/H	BACT-PSD	1.50 PPMVD	@ 15% O2 FOR CT AND DB -GAS
FL-0303	FPL WEST COUNTY ENERGY CENTER UNIT 3	PALM BEACH COUNTY	FL	7/30/2008	THREE NOMINAL 250 MW CTG (EACH) WITH SUPPLEMENTARY-FIRED HRSG	2333 MMBTU/H	BACT-PSD	1.50 PPMVD	
*MN-0071	FAIRBAULT ENERGY PARK	RICE	MN	6/5/2007	COMBINED CYCLE COMBUSTION TURBINE W/DUCT BURNER	1758 MMBTU/H	BACT-PSD	1.50 PPMVD	CTG NG NO DB
FL-0286	FPL WEST COUNTY ENERGY CENTER	PALM BEACH	FL	1/10/2007	COMBINED CYCLE COMBUSTION GAS TURBINES - 6 UNITS	2333 MMBTU/H	BACT-PSD	1.50 PPMVD @ 15 % O2	GAS
NH-0012	NEWINGTON ENERGY LLC	ROCKINGAM	NH	4/26/1999	TURBINES, COMBINED CYCLE, NATURAL GAS	160 MW	Other Case-by-Case	#REF! PPMV @ 15% 02	
IN-0110	COGENTRIX LAWRENCE CO., LLC	LAWRENCE	IN	10/5/2001	TURBINES, COMBINED CYCLE, (3)	1944.1 MMBTU/H	BACT-PSD	#REF! PPM @ 15% O2	
TX-0311	GUADALUPE GENERATING STATION	GUADALUPE	TX	2/15/1999	(4) TURBINES - ONLY, CTG-1 TO 4	170 MW EACH	BACT-PSD	1.60 PPM @ 15% O2	EACH UNIT
NJ-0043	LIBERTY GENERATING STATION	UNION	NJ	3/28/2002	COMBINED CYCLE TURBINE WITH DUCT BURNER	3202 MMBTU/H	Other Case-by-Case	1.70 PPMVD @ 15% O2	
MA-0029	SITHE MYSTIC DEVELOPMENT LLC	SUFFOLK	MA	9/29/1999	TURBINE, COMBINED CYCLE, NATURAL GAS (2)	2699 MMBTU/H	LAER	1.70 PPM@15%O2	DUCT FIREd
AZ-0040	APS WEST PHOENIX	MARICOPA	AZ	5/26/2000	TURBINE, COMBINED CYCLE, DUCT BURNER, NAT GAS, CC4	130 MW	LAER	#REF! PPM @ 15% O2	
PA-0160	CALPINE CONSTRUCTION FINANCE CO., LP	BERKS	PA	10/10/2000	TURBINE, COMBINED CYCLE, NATURAL GAS	182 MW	LAER	1.80 PPM @ 15% O2	
NJ-0044	MANTUA CREEK GENERATING FACILITY	GLOUCESTER	NJ	6/26/2001	COMBUSTION TURBINE WITH DUCT BURNER (3)	2181 MMBTU/H	Other Case-by-Case	1.80 PPMVD @ 15% O2	
*GA-0127	PLANT MCDONOUGH COMBINED CYCLE	COBB	GA	1/7/2008	COMBINED CYCLE COMBUSTION TURBINE	254 MW	LAER	1.80 PPM @ 15% O2	3-HOUR, WITH DUCT BURNER
PA-0184	CALPINE BERKS ONTELAUNEE POWER PLANT	BERKS	PA	10/10/2000	TURBINES, COMBINED CYCLE, (2)	544 MW	Other Case-by-Case	1.80 PPM @ 15% O2	
AR-0026	PINE BLUFF ENERGY LLC - PINE BLUFF ENERGY CENTER	JEFFERSON	AR	5/5/1999	TURBINE, COMBINED CYCLE, NATURAL GAS	170 MW	BACT-PSD	#REF! PPM @ 15% O2	
AR-0043	PINE BLUFF ENERGY LLC	JEFFERSON	AR	2/27/2001	TURBINE, COMBINED CYCLE, NATURAL GAS	170 MW	BACT-PSD	#REF! PPM @ 15% O2	
FL-0263	FPL TURKEY POINT POWER PLANT	DADE	FL	2/8/2005	170 MW COMBUSTION TURBINE, 4 UNITS	170 MW		1.90 PPMVD @ 15 % O2	STACK TEST (DUCT BURNER) GAS

Table C-3 Gas Turbine VOC Emission Limits from EPA'S RACT/BACT/LAER Clearing House (December 2009)

RBLCID	FACILITY NAME	COUNTY	STATE	PERMIT DATE	PROCESS NAME	Size	CASE-BY-CASE BASIS	Emission Limit	
NV-0037	COPPER MOUNTAIN POWER	CLARK	NV	5/14/2004	LARGE COMBUSTION TURBINES, COMBINED CYCLE & COGENERATION	600 MW	LAER	1.90 PPMVD	15% OXYGEN, 3-HR AVE. W/O DUCT FIRING
IN-0114	MIRANT SUGAR CREEK LLC	VIGO	IN	7/24/2002	TURBINE, COMBINED CYCLE, NATURAL GAS (4)	1490.5 MMBTU/H	BACT-PSD	#REF! PPM @ 15% O2	
CA-0950	VALERO REFINING COMPANY	SOLANO COUNTY	CA	1/11/2000	COMBUSTION TURBINE, COMBINED CYCLE, (2)	102 MW	LAER	#REF!	
TX-0405	WESTVACO TEXAS LP	JASPER	TX	12/15/2000	TURBINE, COMBINED CYCLE, W/O DUCT BURNER	42 MW	RACT	1.98 PPM @ 15% O2	
TX-0250	CHANNELVIEW COGENERATION FACILITY	HARRIS	TX	12/9/1999	COGENERATION FACILITY	800 MW	LAER	2.00 PPM @ 15% O2	FROM TURBINE
VA-0261	CPV CUNNINGHAM CREEK	FLUVANNA	VA	9/6/2002	TURBINE, COMBINED CYCLE, (2)	2132 MMBTU/H	BACT-PSD	2.00 PPMVD @ 15% O2	> 70% LOAD
FL-0216	HINES ENERGY COMPLEX, POWER BLOCK 2	POLK	FL	6/4/2001	TURBINES, COMBINED CYCLE, NATURAL GAS, 2	1915 MMBTU/H	BACT-PSD	2.00 PPM @ 15% O2	
TX-0299	KAUFMAN COGEN LP	KAUFMAN	TX	1/31/2000	(2) GAS TURBINES, HRSG-1 & -2	180 MW, EACH	Other Case-by-Case	2.00 PPM @ 15% O2	1 H AV, EACH UNIT
TX-0293	GREGORY POWER FACILITY	SAN PATRICO	TX	6/16/1999	(2) COMBUSTION TURBINES, NO DUCT BURN, EPN 101&102	185 MW, EA	BACT-PSD	2.00 PPM @ 15% O2	1 H AV, EXCEPT STARTUP/SHUTDOWN, EACH
MN-0060	HIGH BRIDGE GENERATING PLANT	RAMSEY	MN	8/12/2005	2 COMBINED-CYCLE COMBUSTION TURBINES	330 MEGAWATTS	BACT-PSD	2.00 PPM @ 15% O2	
CA-1096	VERNON CITY LIGHT & POWER	LOS ANGELES	CA	5/27/2003	GAS TURBINE: COMBINED CYCLE < 50 MW	MW GAS TURBINE, 43 55 MW STEAM TURBINE	BACT-PSD	2.00 PPM @ 15% O2	
CA-1097	MAGNOLIA POWER PROJECT, SCPPA	LOS ANGELES	CA	5/27/2003	GAS TURBINE: COMBINED CYCLE >= 50 MW	NET MW (GAS 181 TURBINE W/STEAM	BACT-PSD	2.00 PPM @ 15% O2	
FL-0256	HINES ENERGY COMPLEX, POWER BLOCK 3	POLK	FL	9/8/2003	COMBUSTION TURBINES, COMBINED CYCLE, NATURAL GAS,2	1830 MMBTU/H	BACT-PSD	2.00 PPM @ 15% O2	
GA-0093	AUGUSTA ENERGY CENTER	RICHMOND	GA	10/28/2001	TURBINE, COMBINED CYCLE, (3)	750 MW	BACT-PSD	2.00 PPM @ 15% O2	
GA-0102	WANSLEY COMBINED CYCLE ENERGY FACILITY	HEARD	GA	1/15/2002	TURBINE, COMBINED CYCLE, (2)	167 MW	BACT-PSD	2.00 PPM @ 15% O2	
GA-0105	MCINTOSH COMBINED CYCLE FACILITY	EFFINGHAM	GA	4/17/2003	TURBINE, COMBINED CYCLE, NATURAL GAS, (4)	140 MW	BACT-PSD	2.00 PPM @ 15% O2	
NC-0094	GENPOWER EARLEYS, LLC	HERTFORD	NC	1/9/2002	TURBINES, COMBINED CYCLE, NATURAL GAS (2)	1715 MMBTU/H	BACT-PSD	2.00 PPM @ 15% O2	
*TX-0546	PATTILLO BRANCH POWER PLANT	FANNIN	TX	6/17/2009	ELECTRICITY GENERATION	350 MW	BACT-PSD	2.00 PPM @ 15% O2	
TX-0296	WISE COUNTY POWER	WISE	TX	7/14/2000	(2) COMBUSTION TURBINES, STACK 1 & 2	230 MW, EA	Other Case-by-Case	2.00 PPM @ 15% O2	YR AV, EXCEPT STARTUP/SHUTDOWN, EACH

Table C-3 Gas Turbine VOC Emission Limits from EPA'S RACT/BACT/LAER Clearing House (December 2009)

RBLCID	FACILITY NAME	COUNTY	STATE	PERMIT DATE	PROCESS NAME	Size	CASE-BY-CASE BASIS	Emission Limit	
MT-0019	CONTINENTAL ENERGY SERVICES, INC., SILVER BOW GEN	SILVER BOW	MT	6/7/2002	TURBINE, COMBINED CYCLE 1	500 MW	Other Case-by-Case	2.00 PPMVD	24-HR
MT-0019	CONTINENTAL ENERGY SERVICES, INC., SILVER BOW GEN	SILVER BOW	MT	6/7/2002	TURBINE, COMBINED CYCLE 2	500 MW	Other Case-by-Case	2.00 PPMVD	@ 15% O2, 24-HR ROLLING AVG
TX-0419	CHANNEL ENERGY FACILITY	HARRIS	TX	3/22/2000	TURBINE, COMBINED CYCLE, AND DUCT BURNER (3)	180 MW	BACT-PSD	2.00 PPM	
FL-0252	FORT PIERCE REPOWERING	ST LUCIE	FL	8/15/2001	TURBINE, COMBINED CYCLE, NATURAL GAS	180 MW	BACT-PSD	2.2 PPMVD @ 15% O2	3-hr test 75% load
PA-0188	FAIRLESS ENERGY LLC	BUCKS	PA	3/28/2002	TURBINE, COMBINED CYCLE	1190 MW	LAER	#REF! PPM @ 15% O2	
PA-0196	SWEC-FALLS TOWNSHIP	BUCKS	PA	8/7/2001	TURBINE, COMBINED CYCLE, NATURAL GAS	544 MW	LAER	#REF! PPM @ 15% O2	
MD-0033	KELSON RIDGE	CHARLES	MD	9/27/2001	COMBINED CYCLE COMBUSTION TURBINE W/ HRSG & DUCT	180 MW	LAER	2.30 PPMVD @ 15% O2	3-HR AVG. WITH OUT DUCT FIRING
NV-0038	IVANPAH ENERGY CENTER, L.P.	CLARK	NV	12/29/2003	LARGE COMBUSTION TURBINES, COMBINED CYCLE & COGENERATION	500 MW	BACT-PSD	2.30 PPMVD	15% OXYGEN, ONE HOUR AVERAGE
VA-0255	VA POWER - POSSUM POINT	PRINCE WILLIAM	VA	11/18/2002	TURBINE, COMBINED CYCLE, NATURAL GAS, DUCT BURNER	1937 MMBTU/H	BACT-PSD	2.30 PPMVD @ 15% O2	EACH UNIT
TX-0232	ELECTRIC GENERATING STATION	HARRIS	TX	8/31/2000	ELECTRIC GENERATION, TURBINE		LAER	2.40 PPM @ 15% O2	
TX-0294	GATEWAY POWER PROJECT	UPSHUR	TX	3/20/2000	(3) COMBUSTION TURBINES & DUCTBURNERS, CTG-1,-2,-3	170 MW, EACH	BACT-PSD	2.40 PPM @ 15% O2	1 H AV, AT FULL LOAD ONLY, EACH UNIT
PA-0226	LIMERICK POWER STATION	MONTGOMERY	PA	4/9/2002	TURBINE, COMBINED CYCLE	550 MW	LAER	2.40 PPM @ 15% O2	
*TX-0548	MADISON BELL ENERGY CENTER	MADISON	TX	8/18/2009	ELECTRICITY GENERATION	275 MW	BACT-PSD	2.5 PPMVD	@ 15% O2, 1-HR ROLLING AVG
VA-0262	MIRANT AIRSIDE INDUSTRIAL PARK	PITTSYLVANIA	VA	12/6/2002	TURBINE, COMBINED CYCLE, (2)	170 MW	BACT-PSD	2.70 PPMVD @ 15% O2	
TX-0405	WESTVACO TEXAS LP	JASPER	TX	12/15/2000	TURBINE, COMBINED CYCLE, W/DUCT BURNER	42 MW	RACT	2.75 PPM @ 15% O2	
AZ-0040	APS WEST PHOENIX	MARICOPA	AZ	5/26/2000	TURBINE, COMBINED CYCLE, DUCT BURNER, NAT GAS, CC5	530 MW	Other Case-by-Case	#REF! PPM @ 15% O2	
AZ-0034	HARQUAHALA GENERATING PROJECT	MARICOPA	AZ	2/15/2001	COMBINED CYCLE, NATURAL GAS	2362 MMBTU/H	Other Case-by-Case	2.80 PPM @ 15% O2	
AZ-0037	PANDA GILA RIVER	MARICOPA	AZ	2/23/2001	TURBINE, COMBINED CYCLE, DUCT BURNER	170 MW	BACT-PSD	2.80 PPM @ 15% O2	3 hr avg
WA-0292	SATSOP COMBUSTION TURBINE PROJECT	GRAYS HARBOR	WA	10/23/2001	(2) NAT GAS COMBINED CYCLE COMBUSTION TURBINES	325 MW	BACT-PSD	2.80 PPM	

Table C-3 Gas Turbine VOC Emission Limits from EPA'S RACT/BACT/LAER Clearing House (December 2009)

RBLCID	FACILITY NAME	COUNTY	STATE	PERMIT DATE	PROCESS NAME	Size	CASE-BY-CASE BASIS	Emission Limit	
CO-0052	ROCKY MOUNTAIN ENERGY CENTER, LLC.	WELD	CO	8/11/2002	TWO (2) NATURAL GAS FIRED, COMBINED-CYCLE, TURBINE	2311 MMBTU/H	BACT-PSD	#REF! PPM @ 15% O2	
RI-0019	RHODE ISLAND STATE ENERGY CENTER	PROVIDENCE	RI	5/3/2000	TURBINE, COMBINED CYCLE (2)	186 MW	BACT-PSD	2.90 PPM @ 15% O2	
FL-0124	OLEANDER POWER PROJECT	BREVARD	FL	11/22/1999	TURBINE-GAS, COMBINED CYCLE, NAT GAS	190 MW	BACT-PSD	3.00 PPM	
AZ-0047	WELLTON MOHAWK GENERATING STATION	YUMA	AZ	12/1/2004	COMBUSTION TURBINE GENERATORS AND HEAT RECOVERY STEAM GENERATORS - GE7FA TURBINES OPTION	170 MW	BACT-PSD	3.00 PPM @ 15% O2	3-HOUR AVERAGE
AZ-0047	WELLTON MOHAWK GENERATING STATION	YUMA	AZ	12/1/2004	COMBUSTION TURBINE GENERATORS AND HEAT RECOVERY STEAM GENERATORS - SW501F TURBINES OPTION	180 MW	BACT-PSD	3.00 PPM @ 15% O2	3-HOUR AVERAGE
AR-0070	GENOVA ARKANSAS I, LLC	WASHINGTON	AR	8/23/2002	TURBINE, COMBINED CYCLE, (2), (SWH)	170 MW	BACT-PSD	3.00 PPM @ 15% O2	3-HOUR AVERAGE
TX-0372	WEST TEXAS ENERGY FACILITY	EL PASO	TX	7/28/2000	(2)GAS TURBINES, W/POWER AUGMENTATION, CASE II	250 MW, EA	BACT-PSD	3.00 PPM @ 15% O2	EACH
CO-0049	NORTH AMERICAN POWER GP - KIOWA CREEK	ARAPAHOE	CO	1/17/2001	COMBINED-CYCLE GAS TURBINES (4) - GENERATORS	250 MW	BACT-PSD	#REF! PPM @ 15% O2	
CO-0056	ROCKY MOUNTAIN ENERGY CENTER, LLC	WELD	CO	5/2/2006	NATURAL-GAS FIRED, COMBINED-CYCLE TURBINE	300 MW	BACT-PSD	#REF! PPM @ 15% O2	
TX-0337	CEDAR BLUFF POWER PROJECT	LIBERTY	TX	12/21/2000	(2) COMBUSTION TURBINES, W/HRSG, STACK1&2	660 MW	LAER	3.30 PPM @ 15% O2	1 H AV, EXCEPT STARTUP/SHUTDOWN, EACH
TX-0343	MONTGOMERY COUNTY POWER PROJECT	MONTGOMERY	TX	6/27/2001	(2) CTG-HRSG STACKS, STACK1 & 2	660 MW, TOTAL	BACT-PSD	3.30 PPM @ 15% O2	1 H AV, EXCEPT STARTUP/SHUTDOWN, EACH
FL-0223	LAKE WORTH GENERATION, LLC	PALM BEACH	FL	11/4/1999	TURBINE, COMBINED CYCLE, NATURAL GAS	186 MW	Other Case-by-Case	3.30 PPM @15% O2 (GAS)	
NC-0082	CAROLINA POWER AND LIGHT - RICHMOND CO. FACILITY	RICHMOND	NC	12/21/2000	TURBINES, COMBINED CYCLE, NATURAL GAS, (2)	157 MW	BACT-PSD	3.50 PPMVD	@15% O2
PA-0197	RELIANT ENERGY HUNTERSTOWN, LLC	ADAMS	PA	6/15/2001	COMBUSTION TURBINE, COMBINED CYCLE, (3)	900 MW	LAER	3.50 PPM @ 15% O2	
NC-0086	FAYETTEVILLE GENERATION, LLC	CUMBERLAND	NC	1/10/2002	TURBINE, COMBINED CYCLE, NATURAL GAS, (2)	154 MW	BACT-PSD	3.50 PPMVD	@15% O2
MS-0073	RELIANT ENERGY CHOCTAW COUNTY, LLC	CHOCTAW	MS	11/23/2004	EMISSION POINT AA-001 GEN. ELEC. COMBUST. TURBINE	230 MW	BACT-PSD	3.64 PPMV @ 15% 02	3-HOUR AVG
MS-0073	RELIANT ENERGY CHOCTAW COUNTY, LLC	CHOCTAW	MS	11/23/2004	EMISSION POINT AA-002 GEN ELEC. COMB. TURBINE	230 MW	BACT-PSD	3.64 PPMV @ 15% 02	3-HOUR AVG
MS-0073	RELIANT ENERGY CHOCTAW COUNTY, LLC	CHOCTAW	MS	11/23/2004	EMISSION POINT AA-003 GEN. ELEC COMB TURBINES	230 MW	BACT-PSD	3.64 PPMV @ 15% 02	3-HOUR AVG
MS-0058	CHOCTAW GAS GENERATION, LLC	CHOCTAW	MS	12/13/2001	TURBINE, COMBINED CYCLE, (2)	2737 MMBTU/H	BACT-PSD	4.00 PPM @ 15% O2	

Table C-3 Gas Turbine VOC Emission Limits from EPA'S RACT/BACT/LAER Clearing House (December 2009)

RBLCID	FACILITY NAME	COUNTY	STATE	PERMIT DATE	PROCESS NAME	Size	CASE-BY-CASE BASIS	Emission Limit	
NY-0098	ATHENS GENERATING PLANT	GREENE	NY	1/19/2007	FUEL COMBUSTION (GAS)	3100 MMBTU/H	LAER	4.00 PPMVD @ 15% O2	3 HOUR BLOCK AVERAGE/ STEADY STATE
MI-0267	RENAISSANCE POWER LLC	MONTCALM	MI	6/7/2001	TURBINES, STATIONARY GAS, COMBINED CYCLE, 3 EACH	170 MW	BACT-PSD	4.00 PPM @ 15% O2	
TX-0437	HARTBURG POWER, LP	NEWTON	TX	7/5/2002	TURBINE, COMBINED CYCLE & DUCT BURNER	277 mw	BACT-PSD	4.00 PPM	
FL-0244	FPL MARTIN PLANT	MARTIN COUNTY	FL	4/16/2003	TURBINE, COMBINED CYCLE WITH DUCT BURNER, NAT GAS	170 MW	BACT-PSD	4.00 PPMVD @ 15% O2	
AR-0047	HOT SPRINGS POWER PROJECT	HOT SPRINGS	AR	11/9/2001	COMBUSTION TURBINE, HRSG, DUCT BURNER	700 MW	BACT-PSD	4.00 PPMVD @ 15% O2	
TX-0297	EXXON-MOBIL BEAUMONT REFINERY	JEFFERSON	TX	3/14/2000	(3) COMBUSTION TURBINES W/DUCT BURN, 61STK001-003	183 MW, EA TURBINE	Other Case-by-Case	4.00 PPMVD @ 15% O2	
AZ-0039	SALT RIVER PROJECT/SANTAN GEN. PLANT	MARICOPA	AZ	3/7/2003	TURBINE, COMBINED CYCLE, DUCT BURNER, NATURAL GAS	175 MW	LAER	4.00 PPMVD @ 15% O2	
AZ-0043	DUKE ENERGY ARLINGTON VALLEY (AVEFII)	MARICOPA	AZ	11/12/2003	TURBINE, COMBINED CYCLE & DUCT BURNER	325 MW	BACT-PSD	4.00 PPMVD @ 15% O2	
FL-0122	CANE ISLAND POWER PARK /KUA - UNIT 3	OSCEOLA	FL	11/24/1999	TURBINE, COMBINED CYCLE, NAT GAS, & DUCT BURNER	1696 MMBTU	BACT-PSD	4.00 PPMVD @ 15% O2	
NV-0035	TRACY SUBSTATION EXPANSION PROJECT	STOREY COUNTY	NV	8/16/2005	TURBINE, COMBINED CYCLE COMBUSTION #1 WITH HRSG AND DUCT BURNER.	306 MW	BACT-PSD	4.00 PPMVD @ 15% O2	
NV-0035	TRACY SUBSTATION EXPANSION PROJECT	STOREY COUNTY	NV	8/16/2005	TURBINE, COMBINED CYCLE COMBUSTION #2 WITH HRSG AND DUCT BURNER.	306 MW	BACT-PSD	4.00 PPMVD @ 15% O2	
TX-0428	HOUSTON OPERATIONS -- BATTLEGROUND SITE	HARRIS	TX	12/19/2002	TURBINE, COMBINED CYCLE & DUCT BURNER	87 mw	BACT-PSD	4.00 PPMVD @ 15% O2	
*TX-0547	NATURAL GAS-FIRED POWER GENERATION FACILITY	LAMAR	TX	6/22/2009	ELECTRICITY GENERATION	250 MW	BACT-PSD	4.00 PPMVD @ 15% O2	
VA-0287	JAMES CITY ENERGY PARK	JAMES CITY	VA	12/1/2003	TURBINE, COMBINED CYCLE, NATURAL GAS,DUCT BURNER	1973 MMBTU/H	BACT-PSD	4.00 PPMVD @ 15% O2	
AZ-0036	PINNACLE WEST ENERGY CORP./REDHAWK GEN. FACILITY	MARICOPA	AZ	12/2/2000	TURBINE, COMBINED CYCLE, DUCT BURNER	175 MW	BACT-PSD	#REF! PPM @ 15% O2	
IN-0110	COGENTRIX LAWRENCE CO., LLC	LAWRENCE	IN	10/5/2001	TURBINES, COMBINED CYCLE, & DUCT BURNERS, (3)	1944.1 MMBTU/H	BACT-PSD	#REF! PPM @ 15% O2	
MI-0303	MIDLAND COGENERATION	MIDLAND	MI	7/26/2001	GAS TURBINE, COMBINED CYCLE, 2 EACH	262 MW	BACT-PSD	4.20 PPM @15% O2	
OK-0070	GENOVA OK I POWER PROJECT	GRADY	OK	6/13/2002	SW COMBUSTION TURBINE	1872 MMBTU/H	BACT-PSD	4.20 PPM @ 15% O2	with duct burners
AL-0143	AEC - MCWILLIAMS PLANT	COVINGTON	AL	3/3/2000	TURBINES, COMBINED CYCLE COMBUSTION (2 EACH)	166 MW	BACT-PSD	#REF! PPM @ 15% O2	

Table C-3 Gas Turbine VOC Emission Limits from EPA'S RACT/BACT/LAER Clearing House (December 2009)

RBLCID	FACILITY NAME	COUNTY	STATE	PERMIT DATE	PROCESS NAME	Size	CASE-BY-CASE BASIS	Emission Limit	
NJ-0036	AES RED OAK LLC	MIDDLESEX	NJ	10/24/2001	THREE 501 F TURBINES WITH HRSG	1967 MMBTU/H AT HHV	BACT-PSD	#REF! PPM @ 15% O2	
LA-0224	ARSENAL HILL POWER PLANT	CADDO	LA	3/20/2008	TWO COMBINED CYCLE GAS TURBINES	2110 MMBTU/H	BACT-PSD	4.90 PPMVD@15%O2	ANNUAL AVERAGE
CT-0151	KLEEN ENERGY SYSTEMS, LLC	MIDDLESEX	CT	2/25/2008	SIEMENS SGT6-5000F COMBUSTION TURBINE #1 AND #2 (NATURAL GAS FIRED) WITH 445 MMBTU/HR NATURAL GAS DUCT BURNER	2.1 MMCF/H	BACT-PSD	5.00 PPMVD @ 15% O2	1-HR BLOCK
IN-0092	WHITING CLEAN ENERGY, INC.	LAKE	IN	7/20/2000	TURBINES, COMBUSTION, NAT GAS (2) W/DUCT BURNER	1735 MMBTU/H	BACT-PSD	#REF! PPM @ 15% O2	
AZ-0033	MESQUITE GENERATING STATION	MARICOPA	AZ	3/22/2001	TURBINE, COMBINED CYCLE, NATURAL GAS	1923 MMBTU/H	BACT-PSD	5.20 PPM @ 15% O2	
AL-0185	BARTON SHOALS ENERGY	COLBERT	AL	7/12/2002	FOUR (4) COMBINED CYCLE COMBUSTION TURBINE UNITS	173 MW	BACT-PSD	5.30 PPM	
AR-0041	TPS - DELL, LLC	MISSISSIPPI	AR	8/8/2000	TURBINE, NATURAL GAS FIRED 2	640 MW	BACT-PSD	#REF! PPM @ 15% O2	
AL-0132	TENASKA ALABAMA GENERATING STATION	AUTAUGA	AL	11/29/1999	TURBINE & DUCT BURNER, NAT GAS, (3)	170 MW	BACT-PSD	#REF! PPMV @ 15% 02	
AL-0141	GPC - GOAT ROCK COMBINED CYCLE PLANT	LEE	AL	4/10/2000	SIX (6) COMBINED CYCLE ELECTRIC GENERATING UNITS	173 MW	BACT-PSD	#REF! PPM @ 15% O2	
AL-0162	AUTAUGAVILLE COMBINED CYCLE PLANT	AUTAUGA	AL	1/8/2001	COMBUSTION TURBINES, COMBINED CYCLE (4)	173 MW	BACT-PSD	#REF! PPM @ 15% O2	
OK-0045	REDBUD POWER PLT	OK	OK	8/15/2001	TURBINE, COMBINED CYCLE, (4)	1698 MMBTU/H	BACT-PSD	7.00 PPM @ 15% O2	
OK-0046	THUNDERBIRD POWER PLT	CLEVELAND	OK	5/17/2001	TURBINES, COMBINED CYCLE, (3)	1698 MMBTU/H	BACT-PSD	7.00 PPM @ 15% O2	
OK-0051	GREEN COUNTRY ENERGY PROJECT	TULSA	OK	10/1/1999	TURBINES WITH DUCT BURNERS, COMBINED CYCLE, (3)		BACT-PSD	7.00 PPM @ 15% O2	

Table C-4 Gas Turbine Particulate Matter Emission Limits from EPA'S RACT/BACT/LAER Clearing House (December 2009)

RBLCID	FACILITY NAME	COUNTY	STATE	PERMIT DATE	PROCESS NAME	Size	POLLUTANT	Emission Limit		
*OK-0129	CHOUTEAU POWER PLANT	MAYES	OK	1/23/2009	COMBINED CYCLE COGENERATION >25MW	1882 MMBTU/H	Particulate matter, total < 10 µ (TPM10)	6.59 lb/hr	3-HR AVG	N/A
LA-0136	PLAQUEMINE COGENERATION FACILITY	IBERVILLE	LA	7/23/2008	(4) GAS TURBINES/DUCT BURNERS	2876 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	33.50 lb/hr	HOURLY MAXIMUM	BACT-PSD
LA-0224	ARSENAL HILL POWER PLANT	CADDO	LA	3/20/2008	TWO COMBINED CYCLE GAS TURBINES	2110 MMBTU/H	Particulate Matter (PM)	24.23 lb/hr	MAX	BACT-PSD
CT-0151	KLEEN ENERGY SYSTEMS, LLC	MIDDLESEX	CT	2/25/2008	SIEMENS SGT6-5000F COMBUSTION TURBINE #1 AND #2 (NATURAL GAS FIRED) WITH 445 MMBTU/HR NATURAL GAS DUCT BURNER	2.1 MMCF/H	Particulate matter, filterable < 10 µ (FPM10)	11.00 lb/hr	W/OUT DUCT BURNER	BACT-PSD
*VA-0308	WARREN COUNTY FACILITY	WARREN	VA	1/14/2008	ELECTRIC GENERATION SECNARIO 3	2204 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	9.90 lb/hr	WITHOUT DUCT BURNER FIRING	N/A
*VA-0308	WARREN COUNTY FACILITY	WARREN	VA	1/14/2008	ELECTRIC GENERATION - SCENARIO 2	1944 MMBTU	Particulate matter, filterable < 10 µ (FPM10)	12.50 lb/hr	WITHOUT DUCT FIRING	N/A
*VA-0308	WARREN COUNTY FACILITY	WARREN	VA	1/14/2008	ELECTRIC GENERATION - SCENARIO 1	1717 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	0.0130 lb/MMBtu		N/A
*MN-0071	FAIRBAULT ENERGY PARK	RICE	MN	6/5/2007	COMBINED CYCLE COMBUSTION TURBINE W/DUCT BURNER	1758 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	0.0100 lb/MMBtu	CTG NG OR CTG & DB NG	BACT-PSD
CA-1144	BLYTHE ENERGY PROJECT II	RIVERSIDE	CA	4/25/2007	2 COMBUSTION TURBINES	170 MW	Particulate matter, filterable < 10 µ (FPM10)	6.00 lb/hr		BACT-PSD
OK-0117	PSO SOUTHWESTERN POWER PLT	CADDO	OK	2/9/2007	GAS-FIRED TURBINES		Particulate matter, filterable < 10 µ (FPM10)	0.0093 lb/MMBtu		BACT-PSD
OK-0115	LAWTON ENERGY COGEN FACILITY	COMANCHE	OK	12/12/2006	COMBUSTION TURBINE AND DUCT BURNER		Particulate matter, filterable < 10 µ (FPM10)	0.0067 lb/MMBtu		BACT-PSD
TX-0502	NACOGDOCHES POWER STERNE GENERATING FACILITY	NACOGDOCHES	TX	6/5/2006	WESTINGHOUSE/SIEMENS MODEL SW501F GAS TURBINE W/ 416.5 MMBTU DUCT BURNERS	190 MW	Particulate matter, filterable < 10 µ (FPM10)	26.90 lb/hr		BACT-PSD
*NY-0095	CAITHNES BELLPORT ENERGY CENTER	SUFFOLK	NY	5/10/2006	COMBUSTION TURBINE	2221 MMBUT/H	Particulate matter, filterable < 10 µ (FPM10)	0.0055 lb/MMBtu	NO DUCT BURNING	BACT-PSD
CO-0056	ROCKY MOUNTAIN ENERGY CENTER, LLC	WELD	CO	5/2/2006	NATURAL-GAS FIRED, COMBINED-CYCLE TURBINE	300 MW	Particulate matter, filterable < 10 µ (FPM10)	0.0074 lb/MMBtu		BACT-PSD
TX-0516	CITY PUBLIC SERVICE JK SPRUCE ELECTRICE GENERATING UNIT 2	BEXAR	TX	12/28/2005	SPRUCE POWER GENERATOR UNIT NO 2		Particulate Matter (PM)	264 lb/hr		BACT-PSD
NC-0101	FORSYTH ENERGY PLANT	FORSYTH	NC	9/29/2005	TURBINE, COMBINED CYCLE, NATURAL GAS, (3)	1844.3 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	0.0190 lb/MMBtu	based on 3-hour average	BACT-PSD
NC-0101	FORSYTH ENERGY PLANT	FORSYTH	NC	9/29/2005	TURBINE & DUCT BURNER, COMBINED CYCLE, NAT GAS, 3	1844.3 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	0.0210 lb/MMBtu	3-hr avg	BACT-PSD
NV-0035	TRACY SUBSTATION EXPANSION PROJECT	STOREY COUNTY	NV	8/16/2005	TURBINE, COMBINED CYCLE COMBUSTION #1 WITH HRSG AND DUCT BURNER.	306 MW	Particulate matter, filterable < 10 µ (FPM10)	0.0110 lb/MMBtu	3-HOUR ROLLING	BACT-PSD
NV-0035	TRACY SUBSTATION EXPANSION PROJECT	STOREY COUNTY	NV	8/16/2005	TURBINE, COMBINED CYCLE COMBUSTION #2 WITH HRSG AND DUCT BURNER.	306 MW	Particulate matter, filterable < 10 µ (FPM10)	0.0110 lb/MMBtu	3-HOUR ROLLING	BACT-PSD
LA-0192	CRESCENT CITY POWER	ORLEANS	LA	6/6/2005	GAS TURBINES - 187 MW (2)	2006 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	29.40 lb/hr	HOURLY MAXIMUM	BACT-PSD

Table C-4 Gas Turbine Particulate Matter Emission Limits from EPA'S RACT/BACT/LAER Clearing House (December 2009)

RBLCID	FACILITY NAME	COUNTY	STATE	PERMIT DATE	PROCESS NAME	Size	POLLUTANT	Emission Limit		
MI-0366	BERRIEN ENERGY, LLC	BERRIEN	MI	4/13/2005	3 COMBUSTION TURBINES AND DUCT BURNERS	1584 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	19.00 lb/hr		BACT-PSD
OH-0252	DUKE ENERGY HANGING ROCK ENERGY FACILITY	LAWRENCE	OH	12/28/2004	TURBINES (4) (MODEL GE 7FA), DUCT BURNERS OFF	172 MW	Particulate matter, filterable < 10 µ (FPM10)	15.00 lb/hr	EACH TURBINE	BACT-PSD
OH-0252	DUKE ENERGY HANGING ROCK ENERGY FACILITY	LAWRENCE	OH	12/28/2004	TURBINES (4) (MODEL GE 7FA), DUCT BURNERS ON	172 MW	Particulate matter, filterable < 10 µ (FPM10)	23.30 lb/hr	EACH TURBINE	BACT-PSD
AZ-0047	WELLTON MOHAWK GENERATING STATION	YUMA	AZ	12/1/2004	COMBUSTION TURBINE GENERATORS AND HEAT RECOVERY STEAM GENERATORS - GE7FA TURBINES OPTION	170 MW	Particulate matter, filterable < 10 µ (FPM10)	29.80 lb/hr	3-HOUR AVERAGE	BACT-PSD
AZ-0047	WELLTON MOHAWK GENERATING STATION	YUMA	AZ	12/1/2004	COMBUSTION TURBINE GENERATORS AND HEAT RECOVERY STEAM GENERATORS - SW501F TURBINES OPTION	180 MW	Particulate matter, filterable < 10 µ (FPM10)	33.10 lb/hr	3-HOUR AVERAGE	BACT-PSD
MS-0073	RELIANT ENERGY CHOCTAW COUNTY, LLC	CHOCTAW	MS	11/23/2004	EMISSION POINT AA-001 GEN. ELEC. COMBUST. TURBINE	230 MW	Particulate matter, filterable < 10 µ (FPM10)	20.59 lb/hr		BACT-PSD
MS-0073	RELIANT ENERGY CHOCTAW COUNTY, LLC	CHOCTAW	MS	11/23/2004	EMISSION POINT AA-002 GEN ELEC. COMB. TURBINE	230 MW	Particulate matter, filterable < 10 µ (FPM10)	20.59 lb/hr		BACT-PSD
MS-0073	RELIANT ENERGY CHOCTAW COUNTY, LLC	CHOCTAW	MS	11/23/2004	EMISSION POINT AA-003 GEN. ELEC COMB TURBINES	230 MW	Particulate matter, filterable < 10 µ (FPM10)	20.59 lb/hr		BACT-PSD
MD-0032	DICKERSON	MONTGOMERY	MD	11/5/2004	UNIT 5 -GE FRAME 7F COM. TURBINES W/ HRSG - NG SC	196 MW	Particulate matter, filterable < 10 µ (FPM10)	9.00 lb/hr	3-HR AVG FIRING NG W/O DB IN SIMP CYCLE	BACT-PSD
MD-0032	DICKERSON	MONTGOMERY	MD	11/5/2004	UNIT 5 -GE FRAME 7F COMB. TURBINES W/ HRSG - NG CC	196 MW	Particulate matter, filterable < 10 µ (FPM10)	15.00 lb/hr	3-HR AVG FIRING NG W/DB IN COMB CYCLE	BACT-PSD
MD-0032	DICKERSON	MONTGOMERY	MD	11/5/2004	UNIT 4 -GE FRAME 7F COM. TURBINES W/ HRSG - NG SC	196 MW	Particulate matter, filterable < 10 µ (FPM10)	21.00 lb/hr	3HR AVG FIRING NG W/O DB IN SIMP. CYCLE	BACT-PSD
MD-0032	DICKERSON	MONTGOMERY	MD	11/5/2004	UNIT 4 -GE FRAME 7F COMB. TURBINES W/ HRSG - NG CC	196 MW	Particulate matter, filterable < 10 µ (FPM10)	26.00 lb/hr	3-HR AVG FIRING NG W/DB IN COMB. CYCLE	BACT-PSD
LA-0191	MICHOUD ELECTRIC GENERATING PLANT	ORLEANS	LA	10/12/2004	COMBUSTION GAS TURBINES 4 & 5 (SIMPLE CYCLE)	1595 MMBTU/H ea.	Particulate matter, filterable < 10 µ (FPM10)	7.85 lb/hr	HOURLY MAXIMUM	BACT-PSD
LA-0191	MICHOUD ELECTRIC GENERATING PLANT	ORLEANS	LA	10/12/2004	COMBUSTION GAS TURBINES 4 & 5 (COMBINED CYCLE)	1595 MM BTU/H ea.	Particulate matter, filterable < 10 µ (FPM10)	7.85 lb/hr	HOURLY MAXIMUM	BACT-PSD
NV-0033	EL DORADO ENERGY, LLC	CLARK	NV	8/19/2004	COMBUSTION TURBINE, COMBINED CYCLE & COGEN(2)	475 MW	Particulate matter, filterable < 10 µ (FPM10)	9.00 lb/hr	For each CTG	LAER
CA-1143	SUTTER POWER PLANT	SUTTER	CA	8/16/2004	2 COMBUSTION TURBINES	170 MW	Particulate matter, filterable < 10 µ (FPM10)	11.50 lb/hr		BACT-PSD
*VA-0291	CPV WARREN LLC	WARREN	VA	7/30/2004	TURBINE, COMBINED CYCLE (2)	1717 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	0.0130 lb/MMBtu		Other Case-by-Case
MN-0053	FAIRBAULT ENERGY PARK	RICE	MN	7/15/2004	TURBINE, SIMPLE CYCLE, NATURAL GAS (1)	1663 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	0.0100 lb/MMBtu	3 HOUR AVERAGE	BACT-PSD
MN-0053	FAIRBAULT ENERGY PARK	RICE	MN	7/15/2004	TURBINE, COMBINED CYCLE, NATURAL GAS (1)	1876 MMBTU/H	Particulate Matter (PM)	0.0100 lb/MMBtu	3 HOUR AVERAGE	BACT-PSD
UT-0066	CURRANT CREEK	JUAB	UT	5/17/2004	NATURAL GAS FIRED TURBINES AND HEAT RECOVERY STEAM GENERATORS		Particulate matter, filterable < 10 µ (FPM10)	0.0660 lb/MMBtu	18-HOUR/TESTED ANNUALLY	BACT-PSD

Table C-4 Gas Turbine Particulate Matter Emission Limits from EPA'S RACT/BACT/LAER Clearing House (December 2009)

RBLCID	FACILITY NAME	COUNTY	STATE	PERMIT DATE	PROCESS NAME	Size	POLLUTANT	Emission Limit		
NV-0037	COPPER MOUNTAIN POWER	CLARK	NV	5/14/2004	LARGE COMBUSTION TURBINES, COMBINED CYCLE & COGENERATION	600 MW	Particulate matter, filterable < 10 µ (FPM10)	21.30 lb/hr		LAER
VA-0289	DUKE ENERGY WYTHE, LLC	WYTHE	VA	2/5/2004	TURBINE, COMBINED CYCLE, NATURAL GAS	170 MW	Particulate matter, filterable < 10 µ (FPM10)	17.50 lb/hr		BACT-PSD
VA-0289	DUKE ENERGY WYTHE, LLC	WYTHE	VA	2/5/2004	TURBINE, COMBINED CYCLE, DUCT BURNER, NATURAL GAS	170 MW	Particulate matter, filterable < 10 µ (FPM10)	23.70 lb/hr		BACT-PSD
OR-0039	COB ENERGY FACILITY, LLC	KLAMATH	OR	12/30/2003	TURBINE, COMBINED CYCLE, DUCT BURNER, NAT GAS, (4)	1150 MW	Particulate matter, filterable < 10 µ (FPM10)	14.00 lb/hr		BACT-PSD
NV-0038	IVANPAH ENERGY CENTER, L.P.	CLARK	NV	12/29/2003	LARGE COMBUSTION TURBINES, COMBINED CYCLE & COGENERATION	500 MW	Particulate matter, filterable < 10 µ (FPM10)	11.25 lb/hr		LAER
MN-0054	MANKATO ENERGY CENTER	BLUE EARTH	MN	12/4/2003	COMBUSTION TURBINE, LARGE, 2 EACH	1916 MMBTU/H	Particulate Matter (PM)	0.0090 lb/MMBtu	3-HOUR AVERAGE	BACT-PSD
MN-0054	MANKATO ENERGY CENTER	BLUE EARTH	MN	12/4/2003	COMBUSTION TURBINE, LARGE, 2 EACH	1916 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	0.0090 lb/MMBtu	3-HOUR AVERAGE	BACT-PSD
MN-0054	MANKATO ENERGY CENTER	BLUE EARTH	MN	12/4/2003	COMBUSTION TURBINE, LARGE 2 EACH	1827 MMBTU/H	Particulate Matter (PM)	0.0570 lb/MMBtu	3-HOUR AVG.	BACT-PSD
MN-0054	MANKATO ENERGY CENTER	BLUE EARTH	MN	12/4/2003	COMBUSTION TURBINE, LARGE 2 EACH	1827 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	0.0570 lb/MMBtu	3-HOUR AVG.	BACT-PSD
VA-0287	JAMES CITY ENERGY PARK	JAMES CITY	VA	12/1/2003	TURBINE, COMBINED CYCLE, NATURAL GAS	1973 MMBTU/H	Particulate Matter (PM)	18.00 lb/hr	each	BACT-PSD
VA-0287	JAMES CITY ENERGY PARK	JAMES CITY	VA	12/1/2003	TURBINE, COMBINED CYCLE, NATURAL GAS	1973 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	18.00 lb/hr	each	BACT-PSD
VA-0287	JAMES CITY ENERGY PARK	JAMES CITY	VA	12/1/2003	TURBINE, COMBINED CYCLE, NATURAL GAS,DUCT BURNER	1973 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	24.70 lb/hr	each	BACT-PSD
VA-0287	JAMES CITY ENERGY PARK	JAMES CITY	VA	12/1/2003	TURBINE, COMBINED CYCLE, NATURAL GAS,DUCT BURNER	1973 MMBTU/H	Particulate Matter (PM)	24.70 lb/hr	each	BACT-PSD
AZ-0043	DUKE ENERGY ARLINGTON VALLEY (AVEFII)	MARICOPA	AZ	11/12/2003	TURBINE, COMBINED CYCLE	325 MW	Particulate matter, filterable < 10 µ (FPM10)	18.00 lb/hr		BACT-PSD
AZ-0043	DUKE ENERGY ARLINGTON VALLEY (AVEFII)	MARICOPA	AZ	11/12/2003	TURBINE, COMBINED CYCLE & DUCT BURNER	325 MW	Particulate matter, filterable < 10 µ (FPM10)	25.00 lb/hr		BACT-PSD
AZ-0049	LA PAZ GENERATING FACILITY	LA PAZ	AZ	9/4/2003	SIEMENS WESTINGHOUSE COMBUSTION TURBINES AND HEAT RECOVERY STEAM GENERATORS	1080 MW	Particulate matter, filterable < 10 µ (FPM10)	30.30 lb/hr		BACT-PSD
AZ-0049	LA PAZ GENERATING FACILITY	LA PAZ	AZ	9/4/2003	GE COMBUSTION TURBINES AND HEAT RECOVERY STEAM GENERATORS	1040 MW	Particulate matter, filterable < 10 µ (FPM10)	45.50 lb/hr		BACT-PSD
CA-0997	SACRAMENTO MUNICIPAL UTILITY DISTRICT	SACRAMENTO COUNTY	CA	9/1/2003	GAS TURBINES, (2)	1611 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	9.00 lb/hr		LAER
OH-0254	DUKE ENERGY WASHINGTON COUNTY LLC	WASHINGTON	OH	8/14/2003	TURBINES (2) (MODEL GE 7FA), DUCT BURNERS OFF	170 MW	Particulate matter, filterable < 10 µ (FPM10)	19.00 lb/hr	EACH TURBINE	BACT-PSD
OH-0254	DUKE ENERGY WASHINGTON COUNTY LLC	WASHINGTON	OH	8/14/2003	TURBINES (2) (MODEL GE 7FA), DUCT BURNERS ON	170 MW	Particulate matter, filterable < 10 µ (FPM10)	28.00 lb/hr	EACH TURBINE	BACT-PSD
OK-0096	REDBUD POWER PLANT	OKLAHOMA	OK	6/3/2003	COMBUSTION TURBINE AND DUCT BURNERS	1832 MMBTU/H	Particulate Matter (PM)	0.0120 lb/MMBtu		BACT-PSD

Table C-4 Gas Turbine Particulate Matter Emission Limits from EPA'S RACT/BACT/LAER Clearing House (December 2009)

RBLCID	FACILITY NAME	COUNTY	STATE	PERMIT DATE	PROCESS NAME	Size	POLLUTANT	Emission Limit		
WA-0315	SUMAS ENERGY 2 GENERATION FACILITY	WHATCOM	WA	4/17/2003	TURBINES, COMBINED CYCLE, (2)	660 MW	Particulate matter, filterable (FPM)	8.08 lb/hr	each	BACT-PSD
WA-0315	SUMAS ENERGY 2 GENERATION FACILITY	WHATCOM	WA	4/17/2003	TURBINES, COMBINED CYCLE, (2)	660 MW	Particulate Matter (PM)	15.70 lb/hr	each	BACT-PSD
GA-0105	MCINTOSH COMBINED CYCLE FACILITY	EFFINGHAM	GA	4/17/2003	TURBINE, COMBINED CYCLE, NATURAL GAS, (4)	140 MW	Particulate Matter (PM)	0.0090 lb/MMBtu	HHV BASIS	BACT-PSD
OK-0090	DUKE ENERGY STEPHENS, LLC STEPHENS ENERGY	STEPHENS	OK	3/21/2003	TURBINES, COMBINED CYCLE (2)	1701 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	0.0150 lb/MMBtu		Other Case-by-Case
OR-0040	KLAMATH GENERATION, LLC	KLAMATH	OR	3/12/2003	TURBINE, COMBINED CYCLE, DUCT BURNER, NAT GAS (2)	480 MW	Particulate matter, filterable < 10 µ (FPM10)	0.0042 lb/MMBtu	8-h avg	BACT-PSD
AZ-0039	SALT RIVER PROJECT/SANTAN GEN. PLANT	MARICOPA	AZ	3/7/2003	TURBINE, COMBINED CYCLE, DUCT BURNER, NATURAL GAS	175 MW	Particulate matter, filterable < 10 µ (FPM10)	0.0100 lb/MMBtu	3 h avg	LAER
MI-0357	KALKASKA GENERATING, INC	KALKASKA	MI	2/4/2003	TURBINE, COMBINED CYCLE, (2)	605 MW	Particulate matter, filterable < 10 µ (FPM10)	38.00 lb/hr		BACT-PSD
MI-0361	SOUTH SHORE POWER LLC	BERRIEN	MI	1/30/2003	TURBINE, COMBINED CYCLE, (2)	172 MW	Particulate matter, filterable < 10 µ (FPM10)	24.00 lb/hr		BACT-PSD
MI-0363	BLUEWATER ENERGY CENTER LLC	ST. CLAIR	MI	1/7/2003	TURBINE, COMBINED CYCLE, (3)	180 MW	Particulate matter, filterable < 10 µ (FPM10)	19.60 lb/hr		BACT-PSD
TX-0352	BRAZOS VALLEY ELECTRIC GENERATING FACILITY	FORT BEND	TX	12/31/2002	(2) HRSG/TURBINES, HRSG-001 & -002	175 MW, EA	Particulate matter, filterable < 10 µ (FPM10)	38.60 lb/hr	EACH UNIT	BACT-PSD
TX-0352	BRAZOS VALLEY ELECTRIC GENERATING FACILITY	FORT BEND	TX	12/31/2002	(2) HRSG/TURBINES, HRSG-003 & -004	175 MW	Particulate matter, filterable < 10 µ (FPM10)	38.60 lb/hr	EACH UNIT	BACT-PSD
TX-0391	OXY COGENERATION FACILITY	HARRIS	TX	12/20/2002	HRSG UNIT NO. 3	255 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	20.00 lb/hr		Other Case-by-Case
TX-0391	OXY COGENERATION FACILITY	HARRIS	TX	12/20/2002	HRSG UNITS 1 & 2 (2)	255 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	20.00 lb/hr		Other Case-by-Case
VA-0262	MIRANT AIRSIDE INDUSTRIAL PARK	PITTSYLVANIA	VA	12/6/2002	TURBINE, COMBINED CYCLE, (2)	170 MW	Particulate matter, filterable < 10 µ (FPM10)	18.00 lb/hr	each unit	BACT-PSD
TX-0407	STERNE ELECTRIC GENERATING FACILITY	NACOGDOCHES	TX	12/6/2002	TURBINES, COMBINED CYCLE, AND DUCT BURNERS (3)	190 MW	Particulate matter, filterable < 10 µ (FPM10)	26.90 lb/hr	EACH	BACT-PSD
VA-0260	HENRY COUNTY POWER	HENRY	VA	11/21/2002	TURBINE, COMBINED CYCLE, (4), 100% LOAD	171 MW	Particulate Matter (PM)	25.30 lb/hr	each unit	BACT-PSD
VA-0260	HENRY COUNTY POWER	HENRY	VA	11/21/2002	TURBINE, COMBINED CYCLE, (4), 100% LOAD	171 MW	Particulate matter, filterable < 10 µ (FPM10)	25.30 lb/hr	each unit	BACT-PSD
VA-0260	HENRY COUNTY POWER	HENRY	VA	11/21/2002	TURBINE, COMBINED CYCLE, (4), 70% LOAD	171 MW	Particulate Matter (PM)	0.0140 lb/MMBtu	@ 70%	BACT-PSD
VA-0260	HENRY COUNTY POWER	HENRY	VA	11/21/2002	TURBINE, COMBINED CYCLE, (4), 70% LOAD	171 MW	Particulate matter, filterable < 10 µ (FPM10)	0.0140 lb/MMBtu	@ 70%	BACT-PSD
VA-0255	VA POWER - POSSUM POINT	PRINCE WILLIAM	VA	11/18/2002	TURBINE, NATURAL GAS, NO DUCT BURNER FIRING	1937 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	18.30 lb/hr	EACH UNIT	BACT-PSD
VA-0255	VA POWER - POSSUM POINT	PRINCE WILLIAM	VA	11/18/2002	TURBINE, COMBINED CYCLE, NATURAL GAS, DUCT BURNER	1937 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	22.20 lb/hr	EACH UNIT	BACT-PSD
GA-0101	MURRAY ENERGY FACILITY	MURRAY	GA	10/23/2002	TURBINE, COMBINED CYCLE, (4)	173 MW	Particulate Matter (PM)	25.00 lb/hr		BACT-PSD
OH-0248	LAWRENCE ENERGY	LAWRENCE	OH	9/24/2002	TURBINES (3), COMBINED CYCLE, DUCT BURNERS OFF	180 MW	Particulate matter, filterable < 10 µ (FPM10)	12.70 lb/hr		BACT-PSD
MS-0059	PIKE GENERATION FACILITY	PIKE	MS	9/24/2002	TURBINE AA-001 W/DUCT BURNER	2168 MMBTU/H	Particulate Matter (PM)	44.20 lb/hr		BACT-PSD
MS-0059	PIKE GENERATION FACILITY	PIKE	MS	9/24/2002	TURBINE AA-001 W/DUCT BURNER	2168 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	44.20 lb/hr		BACT-PSD

Table C-4 Gas Turbine Particulate Matter Emission Limits from EPA'S RACT/BACT/LAER Clearing House (December 2009)

RBLCID	FACILITY NAME	COUNTY	STATE	PERMIT DATE	PROCESS NAME	Size	POLLUTANT	Emission Limit		
MS-0059	PIKE GENERATION FACILITY	PIKE	MS	9/24/2002	TURBINE, AA-002 W /DUCT BURNER	2168 MMBTU/H	Particulate Matter (PM)	44.20 lb/hr		BACT-PSD
MS-0059	PIKE GENERATION FACILITY	PIKE	MS	9/24/2002	TURBINE, AA-002 W /DUCT BURNER	2168 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	44.20 lb/hr		BACT-PSD
MS-0059	PIKE GENERATION FACILITY	PIKE	MS	9/24/2002	TURBINE, AA-003 /DUCT BURNER	2168 MMBTU/H	Particulate Matter (PM)	44.20 lb/hr		BACT-PSD
MS-0059	PIKE GENERATION FACILITY	PIKE	MS	9/24/2002	TURBINE, AA-003 /DUCT BURNER	2168 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	44.20 lb/hr		BACT-PSD
MS-0059	PIKE GENERATION FACILITY	PIKE	MS	9/24/2002	TURBINE AA-004 W/ DUCT BURNER	2168 MMBTU/H	Particulate Matter (PM)	44.20 lb/hr		BACT-PSD
MS-0059	PIKE GENERATION FACILITY	PIKE	MS	9/24/2002	TURBINE AA-004 W/ DUCT BURNER	2168 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	44.20 lb/hr		BACT-PSD
OH-0248	LAWRENCE ENERGY	LAWRENCE	OH	9/24/2002	TURBINES (3), COMBINED CYCLE, DUCT BURNERS ON	180 MW	Particulate matter, filterable < 10 µ (FPM10)	0.0101 lb/MMBtu		BACT-PSD
WA-0299	SUMAS ENERGY 2 GENERATION FACILITY	WHATCOM	WA	9/6/2002	TURBINES, COMBINED CYCLE, (2)	334.5 MW	Particulate matter, filterable (FPM)	0.0039 lb/MMBtu	24 h avg	BACT-PSD
WA-0299	SUMAS ENERGY 2 GENERATION FACILITY	WHATCOM	WA	9/6/2002	TURBINES, COMBINED CYCLE, (2)	334.5 MW	Particulate matter, filterable < 10 µ (FPM10)	0.0115 lb/MMBtu	24 h avg	BACT-PSD
VA-0261	CPV CUNNINGHAM CREEK	FLUVANNA	VA	9/6/2002	TURBINE, COMBINED CYCLE, (2)	2132 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	0.0119 lb/MMBtu	each unit	BACT-PSD
AR-0070	GENOVA ARKANSAS I, LLC	WASHINGTON	AR	8/23/2002	TURBINE, COMBINED CYCLE, (2), (SWH)	170 MW	Particulate matter, filterable < 10 µ (FPM10)	17.00 lb/hr		BACT-PSD
AR-0070	GENOVA ARKANSAS I, LLC	WASHINGTON	AR	8/23/2002	TURBINE, COMBINED CYCLE, (2), (MHI)	170 MW	Particulate matter, filterable < 10 µ (FPM10)	18.50 lb/hr		BACT-PSD
AR-0070	GENOVA ARKANSAS I, LLC	WASHINGTON	AR	8/23/2002	TURBINE, COMBINED CYCLE, (2), (GE)	170 MW	Particulate matter, filterable < 10 µ (FPM10)	19.50 lb/hr		BACT-PSD
CO-0052	ROCKY MOUNTAIN ENERGY CENTER, LLC.	WELD	CO	8/11/2002	TWO (2) NATURAL GAS FIRED, COMBINED-CYCLE, TURBINE	2311 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	0.0065 lb/MMBtu	SEE POLLUTANT NOTES	BACT-PSD
IN-0114	MIRANT SUGAR CREEK LLC	VIGO	IN	7/24/2002	TURBINE, COMBINED CYCLE AND DUCT BURNER, NAT GAS	1490.5 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	20.20 lb/hr	each	BACT-PSD
IN-0114	MIRANT SUGAR CREEK LLC	VIGO	IN	7/24/2002	TURBINES, SIMPLE CYCLE, NATURAL GAS, (4)	1490.5 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	0.0120 lb/MMBtu		BACT-PSD
IN-0114	MIRANT SUGAR CREEK LLC	VIGO	IN	7/24/2002	TURBINE, COMBINED CYCLE, NATURAL GAS (4)	1490.5 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	0.0120 lb/MMBtu		BACT-PSD
AL-0185	BARTON SHOALS ENERGY	COLBERT	AL	7/12/2002	FOUR (4) COMBINED CYCLE COMBUSTION TURBINE UNITS	173 MW	Particulate matter, filterable < 10 µ (FPM10)	0.0060 lb/MMBtu		BACT-PSD
NM-0044	CLOVIS ENERGY FACILITY	CURRY	NM	6/27/2002	TURBINES, COMBINED CYCLE, NATURAL GAS (4)	1515 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	19.00 lb/hr		BACT-PSD
MS-0055	EL PASO MERCHANT ENERGY CO.	COAHOMA	MS	6/24/2002	TURBINE, COMBINED CYCLE, DUCT BURNER, NAT GAS, (2)	1737 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	20.50 lb/hr		BACT-PSD
OK-0070	GENOVA OK I POWER PROJECT	GRADY	OK	6/13/2002	SW COMBUSTION TURBINE	1872 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	0.0092 lb/MMBtu		BACT-PSD
OK-0070	GENOVA OK I POWER PROJECT	GRADY	OK	6/13/2002	MHI COMBUSTION TURBINE & DUCT BURNERS	1767 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	0.0100 lb/MMBtu		BACT-PSD
OK-0070	GENOVA OK I POWER PROJECT	GRADY	OK	6/13/2002	GE COMBUSTION TURBINE & DUCT BURNERS	1705 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	0.0190 lb/MMBtu		BACT-PSD
MT-0019	CONTINENTAL ENERGY SERVICES, INC., SILVER BOW GEN	SILVER BOW	MT	6/7/2002	TURBINE, COMBINED CYCLE 1	500 MW	Particulate matter, filterable < 10 µ (FPM10)	32.40 lb/hr		Other Case-by-Case

Table C-4 Gas Turbine Particulate Matter Emission Limits from EPA'S RACT/BACT/LAER Clearing House (December 2009)

RBLCID	FACILITY NAME	COUNTY	STATE	PERMIT DATE	PROCESS NAME	Size	POLLUTANT	Emission Limit		
MT-0019	CONTINENTAL ENERGY SERVICES, INC., SILVER BOW GEN	SILVER BOW	MT	6/7/2002	TURBINE, COMBINED CYCLE 2	500 MW	Particulate matter, filterable < 10 µ (FPM10)	32.40 lb/hr		Other Case-by-Case
NC-0095	MIRANT GASTONIA POWER FACILITY	GASTON	NC	5/28/2002	TURBINES, COMBINED CYCLE, GE	175 MW	Particulate matter, filterable < 10 µ (FPM10)	14.10 lb/hr	@ 100% load, 3-h avg	BACT-PSD
NC-0095	MIRANT GASTONIA POWER FACILITY	GASTON	NC	5/28/2002	TURBINES, COMBINED CYCLE, GE, DUCT BURNERS	175 MW	Particulate matter, filterable < 10 µ (FPM10)	16.85 lb/hr	3-h avg	BACT-PSD
NC-0095	MIRANT GASTONIA POWER FACILITY	GASTON	NC	5/28/2002	TURBINES, COMBINED CYCLE, MHI/SW	175 MW	Particulate matter, filterable < 10 µ (FPM10)	18.79 lb/hr	@ 100%, 3-h avg	Other Case-by-Case
NC-0095	MIRANT GASTONIA POWER FACILITY	GASTON	NC	5/28/2002	TURBINES, COMBINED CYCLE, MHI/SW, DUCT BURNERS	175 MW	Particulate matter, filterable < 10 µ (FPM10)	21.32 lb/hr	3-h avg	BACT-PSD
OH-0264	NORTON ENERGY STORAGE, LLC	SUMMIT	OH	5/23/2002	COMBUSTION TURBINE (9), COMB CYCLE W/O DUCT BURNER	300 MW	Particulate matter, filterable < 10 µ (FPM10)	12.00 lb/hr		BACT-PSD
OH-0264	NORTON ENERGY STORAGE, LLC	SUMMIT	OH	5/23/2002	COMBUSTION TURBINES (9), COMB CYCLE W DUCT BURNER	300 MW	Particulate matter, filterable < 10 µ (FPM10)	13.00 lb/hr		BACT-PSD
AZ-0038	GILA BEND POWER GENERATING STATION	MARICOPA	AZ	5/15/2002	TURBINE, COMBINED CYCLE, DUCT BURNER, NATURAL GAS	170 MW	Particulate matter, filterable < 10 µ (FPM10)	0.0140 lb/MMBtu	3 h avg	BACT-PSD
IA-0058	GREATER DES MOINES ENERGY CENTER	POLK	IA	4/10/2002	COMBUSTION TURBINES -SIMPLE CYCLE	350 MW	Particulate matter, filterable < 10 µ (FPM10)	0.0094 lb/MMBtu		BACT-PSD
IA-0058	GREATER DES MOINES ENERGY CENTER	POLK	IA	4/10/2002	COMBUSTION TURBINES - COMBINED CYCLE	350 MW	Particulate matter, filterable < 10 µ (FPM10)	0.0108 lb/MMBtu	3 hour ave.	BACT-PSD
PA-0226	LIMERICK POWER STATION	MONTGOMERY	PA	4/9/2002	TURBINE, COMBINED CYCLE	550 MW	Particulate matter, filterable < 10 µ (FPM10)	0.0140 lb/MMBtu		Other Case-by-Case
AR-0051	DUKE ENERGY-JACKSON FACILITY	JACKSON	AR	4/1/2002	TURBINES, COMBINED CYCLE, NATURAL GAS, (2)	170 MW	Particulate matter, filterable < 10 µ (FPM10)	32.20 lb/hr	each ct & hrsg	BACT-PSD
NJ-0043	LIBERTY GENERATING STATION	UNION	NJ	3/28/2002	COMBINED CYCLE TURBINE (3)	2964 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	35.80 lb/hr		BACT-PSD
NJ-0043	LIBERTY GENERATING STATION	UNION	NJ	3/28/2002	COMBINED CYCLE TURBINE WITH DUCT BURNER	3202 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	38.80 lb/hr		Other Case-by-Case
PA-0188	FAIRLESS ENERGY LLC	BUCKS	PA	3/28/2002	TURBINE, COMBINED CYCLE	1190 MW	Particulate matter, filterable < 10 µ (FPM10)	0.0140 lb/MMBtu		BACT-PSD
OH-0268	LIMA ENERGY COMPANY	ALLEN	OH	3/26/2002	COMBUSTION TURBINE (2), COMBINED CYCLE	170 MW	Particulate matter, filterable < 10 µ (FPM10)	18.00 lb/hr		BACT-PSD
TX-0411	AMELIA ENERGY CENTER	JEFFERSON	TX	3/26/2002	TURBINE, COMBINED CYCLE, & DUCT BURNER (3)	180 MW	Particulate matter, filterable < 10 µ (FPM10)	25.60 lb/hr		BACT-PSD
TX-0351	WEATHERFORD ELECTRIC GENERATION FACILITY	PARKER	TX	3/11/2002	(2) GE7121EA GAS TURBINES, S-3&4	1079 MMBTU/H	Particulate Matter (PM)	14.00 lb/hr	EACH UNIT	Other Case-by-Case
TX-0351	WEATHERFORD ELECTRIC GENERATION FACILITY	PARKER	TX	3/11/2002	(2) GE 7241FA GAS TURBINES (TEMP STACK), S-1&2	1910 MMBTU/H	Particulate Matter (PM)	18.00 lb/hr	EACH UNIT	Other Case-by-Case
LA-0157	PERRYVILLE POWER STATION	OUACHITA PARISH	LA	3/8/2002	TURBINE, SIMPLE CYCLE, NAT GAS, EPN 2-1	170 MW	Particulate matter, filterable < 10 µ (FPM10)	18.00 lb/hr		BACT-PSD
LA-0157	PERRYVILLE POWER STATION	OUACHITA PARISH	LA	3/8/2002	TURBINES, COMBINED CYCLE, GAS, (2) EPNS 1-1, 1-2	170 MW	Particulate matter, filterable < 10 µ (FPM10)	23.00 lb/hr		BACT-PSD
LA-0157	PERRYVILLE POWER STATION	OUACHITA PARISH	LA	3/8/2002	TURBINE, COMBINED CYCLE, HRSG, NAT GAS, (2) EPNS 1-1, 1-2	183 MW	Particulate matter, filterable < 10 µ (FPM10)	26.20 lb/hr	HOURLY MAXIMUM	BACT-PSD
WA-0289	TRANSALTA CENTRALIA GENERATION LLC	LEWIS	WA	2/22/2002	(4) TURBINE/HRSG		Particulate matter, filterable < 10 µ (FPM10)	4.10 lb/hr		BACT-PSD
WA-0289	TRANSALTA CENTRALIA GENERATION LLC	LEWIS	WA	2/22/2002	(4) TURBINE/HRSG		Particulate Matter (PM)	4.10 lb/hr		BACT-PSD

Table C-4 Gas Turbine Particulate Matter Emission Limits from EPA'S RACT/BACT/LAER Clearing House (December 2009)

RBLCID	FACILITY NAME	COUNTY	STATE	PERMIT DATE	PROCESS NAME	Size	POLLUTANT	Emission Limit		
AR-0052	THOMAS B. FITZHUGH GENERATING STATION	FRANKLIN	AR	2/15/2002	TURBINE, COMBINED CYCLE, NATURAL GAS	170.6 MW	Particulate matter, filterable < 10 µ (FPM10)	5.90 lb/hr		BACT-PSD
TX-0388	SAND HILL ENERGY CENTER	TRAVIS	TX	2/12/2002	COMBINED CYCLE GAS TURBINE	164 MW	Particulate matter, filterable < 10 µ (FPM10)	32.00 lb/hr		Other Case-by-Case
OK-0055	MUSTANG ENERGY PROJECT	CANADIAN	OK	2/12/2002	COMBUSTION TURBINES W/DUCT BURNERS	0	Particulate matter, filterable < 10 µ (FPM10)	0.0070 lb/MMBtu		BACT-PSD
OK-0056	HORSESHOE ENERGY PROJECT	LINCOLN	OK	2/12/2002	TURBINES AND DUCT BURNERS	310 MW TOTAL	Particulate matter, filterable < 10 µ (FPM10)	0.0117 lb/MMBtu		BACT-PSD
TN-0144	HAYWOOD ENERGY CENTER, LLC	HAYWOOD	TN	2/1/2002	TURBINE, COMBINED CYCLE, W/O DUCT FIRING	1990 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	12.50 lb/hr	EACH	BACT-PSD
TN-0144	HAYWOOD ENERGY CENTER, LLC	HAYWOOD	TN	2/1/2002	TURBINE, COMBINED CYCLE, W/ DUCT FIRING	1990 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	17.50 lb/hr	EACH	BACT-PSD
*LA-0164	ACADIA POWER STATION, ACADIA POWER PARTNERS LLC		LA	1/31/2002	GAS TURBINE UNITS 1, 2, 3, 4	183 MW EACH	Particulate matter, filterable < 10 µ (FPM10)	20.00 lb/hr		BACT-PSD
TX-0350	ENNIS TRACTEBEL POWER	ELLIS	TX	1/31/2002	COMBUSTION TURBINE W/HEAT RECOVERY STEAM GENERATOR	350 MW	Particulate matter, filterable < 10 µ (FPM10)	25.62 lb/hr		Other Case-by-Case
PA-0223	DUKE ENERGY FAYETTE, LLC	FAYETTE	PA	1/30/2002	TURBINE, COMBINED CYCLE, (2)	280 MW	Particulate matter, filterable < 10 µ (FPM10)	34.80 lb/hr		BACT-PSD
FL-0241	CPV CANA	ST LUCIE COUNTY	FL	1/17/2002	TURBINE, COMBINED CYCLE, NATURAL GAS	1680 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	11.00 lb/hr	LB/HR FRONT HALF	BACT-PSD
GA-0102	WANSLEY COMBINED CYCLE ENERGY FACILITY	HEARD	GA	1/15/2002	TURBINE, COMBINED CYCLE, (2)	167 MW	Particulate Matter (PM)	0.0110 lb/MMBtu	LHV BASIS	BACT-PSD
VA-0256	TENASKA FLUVANNA	FLUVANNA	VA	1/11/2002	TURBINES, COMBINED CYCLE, (3), NATURAL GAS	61200 MMSCF/YR	Particulate matter, filterable < 10 µ (FPM10)	16.20 lb/hr	for each turbine	BACT-PSD
NC-0086	FAYETTEVILLE GENERATION, LLC	CUMBERLAND	NC	1/10/2002	TURBINE, COMBINED CYCLE, NATURAL GAS, (2)	154 MW	Particulate matter, filterable < 10 µ (FPM10)	31.30 lb/hr	3-h avg, each	BACT-PSD
NC-0094	GENPOWER EARLEYS, LLC	HERTFORD	NC	1/9/2002	TURBINES, COMBINED CYCLE, NATURAL GAS (2)	1715 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	22.00 lb/hr		BACT-PSD
TX-0234	EDINBURG ENERGY LIMITED PARTNERSHIP	HIDALGO	TX	1/8/2002	(4) COMBINED CYCLE GAS TURBINE, ABB MODEL GT24	180 MW	Particulate matter, filterable < 10 µ (FPM10)	18.00 lb/hr		BACT-PSD
GA-0094	EFFINGHAM COUNTY POWER, LLC	EFFINGHAM	GA	12/27/2001	TURBINE, SIMPLE CYCLE, (2)	185 MW	Particulate matter, filterable < 10 µ (FPM10)	18.00 lb/hr		BACT-PSD
GA-0094	EFFINGHAM COUNTY POWER, LLC	EFFINGHAM	GA	12/27/2001	TURBINE, COMBINED CYCLE, (2)	185 MW	Particulate matter, filterable < 10 µ (FPM10)	21.60 lb/hr		BACT-PSD
OH-0257	JACKSON COUNTY POWER, LLC	JACKSON	OH	12/27/2001	COMBUSTION TURBINES, COMBINED CYCLE, (4)	305 MW	Particulate matter, filterable < 10 µ (FPM10)	30.20 lb/hr		BACT-PSD
WV-0014	PANDA CULLODEN GENERATING STATION	CABELL	WV	12/18/2001	COMBUSTION TURBINE, 300 MW	300 MW	Particulate matter, filterable < 10 µ (FPM10)	18.00 lb/hr	WITHOUT DUCT FIRING	Other Case-by-Case
MS-0058	CHOCTAW GAS GENERATION, LLC	CHOCTAW	MS	12/13/2001	TURBINE, COMBINED CYCLE, (2)	2737 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	31.10 lb/hr		BACT-PSD
AL-0180	DUKE ENERGY DALE, LLC	DALE	AL	12/11/2001	2 GE 7FA GAS FIRED COMB. CYCLE W/568 MMBTU DUCT B	170 MW EACH	Particulate matter, filterable < 10 µ (FPM10)	0.0072 lb/MMBtu		BACT-PSD
IN-0095	ALLEGHENY ENERGY SUPPLY CO. LLC	ST. JOSEPH	IN	12/7/2001	TWO SIMPLE CYCLE COMBUSTION TURBINES GELM6000	469 MMBTU/H	Particulate Matter (PM)	0.0068 lb/MMBtu		BACT-PSD
IN-0095	ALLEGHENY ENERGY SUPPLY CO. LLC	ST. JOSEPH	IN	12/7/2001	2 CMBND CYCLE COMBUST. TURBINE WESTINGHOUSE 501F	2071 MMBTU/H (HHV)	Particulate Matter (PM)	0.0120 lb/MMBtu		BACT-PSD

Table C-4 Gas Turbine Particulate Matter Emission Limits from EPA'S RACT/BACT/LAER Clearing House (December 2009)

RBLCID	FACILITY NAME	COUNTY	STATE	PERMIT DATE	PROCESS NAME	Size	POLLUTANT	Emission Limit		
MS-0065	LONE OAK ENERGY CENTER, LLC	LOWNDES	MS	11/13/2001	AA-001 COMBUSTION TURBINE, COMBINED CYCLE	1837 MMBTU/H	Particulate Matter (PM)	24.90 lb/hr		BACT-PSD
MS-0065	LONE OAK ENERGY CENTER, LLC	LOWNDES	MS	11/13/2001	AA-001 COMBUSTION TURBINE, COMBINED CYCLE	1837 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	24.90 lb/hr		BACT-PSD
MS-0065	LONE OAK ENERGY CENTER, LLC	LOWNDES	MS	11/13/2001	AA-002 COMBUSTION TURBINE, COMBINED CYCLE	1837 MMBTU/H	Particulate Matter (PM)	24.90 lb/hr		BACT-PSD
MS-0065	LONE OAK ENERGY CENTER, LLC	LOWNDES	MS	11/13/2001	AA-002 COMBUSTION TURBINE, COMBINED CYCLE	1837 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	24.90 lb/hr		BACT-PSD
MS-0065	LONE OAK ENERGY CENTER, LLC	LOWNDES	MS	11/13/2001	AA-003 COMBUSTION TURBINE, COMBINED CYCLE	1837 MMBTU/H	Particulate Matter (PM)	24.90 lb/hr		BACT-PSD
MS-0065	LONE OAK ENERGY CENTER, LLC	LOWNDES	MS	11/13/2001	AA-003 COMBUSTION TURBINE, COMBINED CYCLE	1837 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	24.90 lb/hr		BACT-PSD
MS-0051	LSP- BATESVILLE GENERATION FACILITY	PANOLA	MS	11/13/2001	COMBINED CYCLE COMBUSTION TURBINE GENERATION (CTG)	2100 MMBTU/H	Particulate Matter (PM)	40.00 lb/hr		BACT-PSD
AR-0047	HOT SPRINGS POWER PROJECT	HOT SPRINGS	AR	11/9/2001	COMBUSTION TURBINE, HRSG, DUCT BURNER	700 MW	Particulate matter, filterable < 10 µ (FPM10)	0.0130 lb/MMBtu		BACT-PSD
TX-0233	RELIANT ENERGY-CHANNELVIEW COGENERATION FACILITY	HARRIS	TX	10/29/2001	TURBINE, COMBINED CYCLE, AND DUCT BURNER #1-#4	180 MW	Particulate matter, filterable < 10 µ (FPM10)	23.70 lb/hr	FOR EACH UNIT	BACT-PSD
AL-0181	DUKE ENERGY AUTAUGA, LLC	AUTAUGA	AL	10/23/2001	2 GE COM. CYCLE UNITS W/HRSG & 550 MMBTU/HR DUCT B	2407 MMBTU/H (W/DB)	Particulate matter, filterable < 10 µ (FPM10)	0.0072 lb/MMBtu		BACT-PSD
ID-0010	MIDDLETON FACILITY	CANYON	ID	10/19/2001	(2) GAS TURBINES WITHOUT DUCT BURNERS, NAT GAS		Particulate matter, filterable < 10 µ (FPM10)	15.80 lb/hr	EA	BACT-PSD
ID-0010	MIDDLETON FACILITY	CANYON	ID	10/19/2001	(2) GAS TURBINES WITH DUCT BURNERS, NAT GAS	2097 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	19.70 lb/hr	EA	BACT-PSD
OH-0265	DRESDEN ENERGY LLC	MUSKINGUM	OH	10/16/2001	COMBUSTION TURBINE (2), COMB. CYCLE W/O DUCT BURN	171.7 MW	Particulate matter, filterable < 10 µ (FPM10)	18.30 lb/hr		BACT-PSD
OH-0265	DRESDEN ENERGY LLC	MUSKINGUM	OH	10/16/2001	COMBUSTION TURBINE (2), COMB. CYCLE W DUCT BURN	171.7 MW	Particulate matter, filterable < 10 µ (FPM10)	21.80 lb/hr		BACT-PSD
AR-0057	TENASKA ARKANSAS PARTNERS, LP	LONOKE	AR	10/9/2001	TURBINE, COMBINED CYCLE, NATURAL GAS	185 MW	Particulate matter, filterable < 10 µ (FPM10)	0.0110 lb/MMBtu	100% LOAD	BACT-PSD
IN-0110	COGENTRIX LAWRENCE CO., LLC	LAWRENCE	IN	10/5/2001	TURBINES, COMBINED CYCLE, & DUCT BURNERS, (3)	1944.1 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	0.0140 lb/MMBtu		BACT-PSD
IN-0110	COGENTRIX LAWRENCE CO., LLC	LAWRENCE	IN	10/5/2001	TURBINES, COMBINED CYCLE, (3)	1944.1 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	0.0170 lb/MMBtu		BACT-PSD
AL-0179	TENASKA TALLADEGA GENERATING STATION	TALLADEGA	AL	10/3/2001	COMBINED CYCLE COMB. TURB. UNITS W/ DUCT FIRING (6	170 MW	Particulate matter, filterable < 10 µ (FPM10)	0.0035 lb/MMBtu		BACT-PSD
MD-0033	KELSON RIDGE	CHARLES	MD	9/27/2001	COMBINED CYCLE COMBUSTION TURBINE W/ HRSG & DUCT	180 MW	Particulate matter, filterable < 10 µ (FPM10)	9.10 lb/hr	3-HR ROLLING AVG. WITHOUT DUCT FIRING	BACT-PSD
FL-0226	EL PASO MANATEE ENERGY CENTER	MANATEE	FL	9/11/2001	TURBINE, SIMPLE CYCLE, NAT. GAS (2)	1.79 MMCF/H	Particulate matter, filterable < 10 µ (FPM10)	20.00 lb/hr		BACT-PSD
FL-0226	EL PASO MANATEE ENERGY CENTER	MANATEE	FL	9/11/2001	TURBINE, COMBINED CYCLE, NAT. GAS	1.79 MMCF/H	Particulate matter, filterable < 10 µ (FPM10)	20.00 lb/hr		BACT-PSD
FL-0227	EL PASO BELLE GLADE ENERGY CENTER	PALM BEACH	FL	9/7/2001	TURBINE, COMBINED CYCLE, NAT. GAS	1.79 MMCF/H	Particulate matter, filterable < 10 µ (FPM10)	20.00 lb/hr		BACT-PSD
WA-0288	LONGVIEW ENERGY DEVELOPMENT	COWLITZ	WA	9/4/2001	COMBUSTION TURBINE, COMBINEDCYCLE (NG)	290 MW	Particulate matter, filterable (FPM)	10.00 lb/hr		Other Case-by-Case

Table C-4 Gas Turbine Particulate Matter Emission Limits from EPA'S RACT/BACT/LAER Clearing House (December 2009)

RBLCID	FACILITY NAME	COUNTY	STATE	PERMIT DATE	PROCESS NAME	Size	POLLUTANT	Emission Limit		
NJ-0058	PSEG FOSSIL LLC LINDEN GENERATING STATION	UNION	NJ	8/24/2001	COMBUSTION GAS TURBINES(GE 7FA)(4 UNITS): COMBINED CYCLE	1651 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	21.00 lb/hr		BACT-PSD
TX-0344	DEER PARK ENERGY CENTER	HARRIS	TX	8/22/2001	(4) CTG1-4 & HRSG1-4, ST-1 THRU -4	180 MW, EA	Particulate matter, filterable < 10 µ (FPM10)	33.90 lb/hr	EACH	BACT-PSD
FL-0225	EL PASO BROWARD ENERGY CENTER	BROWARD	FL	8/17/2001	TURBINE, SIMPLE CYCLE, NAT. GAS (3)	1.79 MMCF/H	Particulate matter, filterable < 10 µ (FPM10)	20.00 lb/hr		BACT-PSD
FL-0225	EL PASO BROWARD ENERGY CENTER	BROWARD	FL	8/17/2001	TURBINE, COMBINED CYCLE, NAT. GAS	1.79 MMCF/H	Particulate matter, filterable < 10 µ (FPM10)	20.00 lb/hr		BACT-PSD
OK-0044	SMITH POCOLA ENERGY PROJECT	OKLAHOMA	OK	8/16/2001	TURBINES, NATURAL GAS, (4)	171.5 MW	Particulate matter, filterable < 10 µ (FPM10)	9.00 lb/hr	each	BACT-PSD
OK-0044	SMITH POCOLA ENERGY PROJECT	OKLAHOMA	OK	8/16/2001	TURBINES, COMBINED CYCLE, NATURAL GAS, (4)	171.5 MW	Particulate matter, filterable < 10 µ (FPM10)	14.70 lb/hr	each	BACT-PSD
OK-0045	REDBUD POWER PLT	OK	OK	8/15/2001	TURBINE, COMBINED CYCLE, (4)	1698 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	0.0100 lb/MMBtu		BACT-PSD
OH-0263	FREMONT ENERGY CENTER, LLC	SANDUSKY	OH	8/9/2001	COMBUSTION TURBINES(2), COMB CYCLE W/O DUCT BURNER	180 MW	Particulate matter, filterable < 10 µ (FPM10)	13.70 lb/hr		BACT-PSD
OH-0263	FREMONT ENERGY CENTER, LLC	SANDUSKY	OH	8/9/2001	COMBUSTION TURBINES (2), COMB CYCLE W DUCT BURNER	180 MW	Particulate matter, filterable < 10 µ (FPM10)	24.70 lb/hr		BACT-PSD
FL-0240	CPV PIERCE	POLK	FL	8/7/2001	TURBINE, COMBINED CYCLE, NATURAL GAS	1680 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	11.00 lb/hr	LB/HR GAS FRONT HALF	BACT-PSD
PA-0196	SWEC-FALLS TOWNSHIP	BUCKS	PA	8/7/2001	TURBINE, COMBINED CYCLE, NATURAL GAS	544 MW	Particulate matter, filterable < 10 µ (FPM10)	0.0140 lb/MMBtu		BACT-PSD
MI-0303	MIDLAND COGENERATION	MIDLAND	MI	7/26/2001	GAS TURBINE, COMBINED CYCLE, 2 EACH	262 MW	Particulate matter, filterable < 10 µ (FPM10)	0.0200 lb/MMBtu		BACT-PSD
PA-0228	SPRINGDALE TOWNSHIP STATION	ALLEGHENY	PA	7/12/2001	TURBINE, COMBINED CYCLE	2094 MMBTU/H	Particulate Matter (PM)	19.00 lb/hr	each unit	BACT-PSD
TX-0343	MONTGOMERY COUNTY POWER PROJECT	MONTGOMERY	TX	6/27/2001	(2) CTG-HRSG STACKS, STACK1 & 2	660 MW, TOTAL	Particulate matter, filterable < 10 µ (FPM10)	21.25 lb/hr	EACH UNIT	BACT-PSD
NJ-0044	MANTUA CREEK GENERATING FACILITY	GLOUCESTER	NJ	6/26/2001	COMBUSTION TURBINE WITHOUT DUCT BURNER, 60% LOAD		Particulate matter, filterable < 10 µ (FPM10)	20.90 lb/hr		N/A
NJ-0044	MANTUA CREEK GENERATING FACILITY	GLOUCESTER	NJ	6/26/2001	COMBUSTION TURBINE WITH DUCT BURNER (3)	2181 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	0.0130 lb/MMBtu		N/A
NJ-0044	MANTUA CREEK GENERATING FACILITY	GLOUCESTER	NJ	6/26/2001	COMBUSTION TURBINE WITHOUT DUCT BURNER		Particulate matter, filterable < 10 µ (FPM10)	0.0130 lb/MMBtu		N/A
NJ-0044	MANTUA CREEK GENERATING FACILITY	GLOUCESTER	NJ	6/26/2001	COMBUSTION TURBINE WITHOUT DUCT BURNER, 75% LOAD		Particulate matter, filterable < 10 µ (FPM10)	0.0154 lb/MMBtu		N/A
MI-0267	RENAISSANCE POWER LLC	MONTCALM	MI	6/7/2001	STATIONARY GAS TURBINES, SIMPLE CYCLE 4 EACH	170 MW	Particulate matter, filterable < 10 µ (FPM10)	9.00 lb/hr		BACT-PSD
MI-0267	RENAISSANCE POWER LLC	MONTCALM	MI	6/7/2001	TURBINES, STATIONARY GAS, COMBINED CYCLE, 3 EACH	170 MW	Particulate matter, filterable < 10 µ (FPM10)	10.70 lb/hr		BACT-PSD
IN-0085	PSEG LAWRENCEBURG ENERGY FACILITY	DEARBORN	IN	6/7/2001	TURBINE, NATURAL GAS, COMBINED CYCLE FOUR	476.6 MMBTU/H	Particulate Matter (PM)	21.00 lb/hr		BACT-PSD
IN-0087	DUKE ENERGY, VIGO LLC	VIGO	IN	6/6/2001	TURBINE, NATURAL GAS, COMBINED CYCLE (2)	170 MW	Particulate matter, filterable < 10 µ (FPM10)	0.0120 lb/MMBtu		BACT-PSD
FL-0216	HINES ENERGY COMPLEX, POWER BLOCK 2	POLK	FL	6/4/2001	TURBINES, COMBINED CYCLE, NATURAL GAS, 2	1915 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	7.30 lb/hr		BACT-PSD
OK-0046	THUNDERBIRD POWER PLT	CLEVELAND	OK	5/17/2001	TURBINES, COMBINED CYCLE, (3)	1698 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	0.0100 lb/MMBtu		BACT-PSD

Table C-4 Gas Turbine Particulate Matter Emission Limits from EPA'S RACT/BACT/LAER Clearing House (December 2009)

RBLCID	FACILITY NAME	COUNTY	STATE	PERMIT DATE	PROCESS NAME	Size	POLLUTANT	Emission Limit		
LA-0153	CARVILLE ENERGY CENTER	IBERVILLE PARISH	LA	5/16/2001	GAS TURBINES- 2 (1-98A, 2-98A)	1908 MMBTU/H (EACH)	Particulate matter, filterable < 10 µ (FPM10)	19.73 lb/hr	HOURLY MAXIMUM	BACT-PSD
IN-0086	MIRANT SUGAR CREEK, LLC	VIGO	IN	5/9/2001	TURBINE, NATURAL GAS, COMBINED CYCLE	170 MW	Particulate matter, filterable < 10 µ (FPM10)	18.00 lb/hr		BACT-PSD
IN-0086	MIRANT SUGAR CREEK, LLC	VIGO	IN	5/9/2001	TURBINE, NATURAL GAS, SIMPLE CYCLE, FOUR	170 MW	Particulate matter, filterable < 10 µ (FPM10)	0.0120 lb/MMBtu		BACT-PSD
NJ-0059	COGEN TECHNOLOGIES LINDEN VENTURE, L.P	UNION	NJ	5/9/2001	COMBUSTION GAS TURBINE(GE): COMBINED CYCLE(THE 6TH UNIT)	1928.2 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	0.0260 lb/MMBtu		BACT-PSD
FL-0219	CPV ATLANTIC POWER GENERATING FACILITY	ST. LUCIE COUNTY	FL	5/3/2001	COMBINED CYCLE COMBUSTION TURBINE, NOMINAL 245 MW	1700 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	11.00 lb/hr		BACT-PSD
SC-0061	COLUMBIA ENERGY LLC	CALHOUN	SC	4/9/2001	TURBINES, COMBINED CYCLE, NATURAL GAS (2)	170 MW (EACH)	Particulate matter, filterable < 10 µ (FPM10)	29.30 lb/hr	EACH TURBINE	BACT-PSD
SC-0071	COLUMBIA ENERGY CENTER I-26 & US HWY 21 SOUTH	CALHOUN	SC	4/9/2001	TURBINE, COMBINED CYCLE, NATURAL GAS, (2)	170 MW	Particulate matter, filterable < 10 µ (FPM10)	29.30 lb/hr	each	BACT-PSD
TN-0156	MEMPHIS GENERATION, LLC	SHELBY	TN	4/9/2001	TURBINE, COMBINED CYCLE, DUCT BURNER, NATURAL GAS	14583 MMSCF/YR	Particulate matter, filterable < 10 µ (FPM10)	0.0120 lb/MMBtu		BACT-PSD
OH-0255	AEP WATERFORD ENERGY LLC	WASHINGTON	OH	3/29/2001	COMBUSTION TURBINES (3), SIMPLE CYCLE	170 MW	Particulate matter, filterable < 10 µ (FPM10)	18.00 lb/hr		BACT-PSD
OH-0255	AEP WATERFORD ENERGY LLC	WASHINGTON	OH	3/29/2001	TURBINES (3), COMBINED CYCLE, W/O DUCT FIRING	170 MW	Particulate matter, filterable < 10 µ (FPM10)	21.00 lb/hr		BACT-PSD
OH-0255	AEP WATERFORD ENERGY LLC	WASHINGTON	OH	3/29/2001	TURBINES (3), COMBINED CYCLE, W/ DUCT FIRING	170 MW	Particulate matter, filterable < 10 µ (FPM10)	25.00 lb/hr		BACT-PSD
MS-0044	CALEDONIA POWER LLC	LOWNDES	MS	3/27/2001	ELECTRIC POWER GENERATION, TURBINE & DUCT BURNER	1700 MMBTU/H	Particulate Matter (PM)	24.00 lb/hr		Other Case-by-Case
AZ-0033	MESQUITE GENERATING STATION	MARICOPA	AZ	3/22/2001	TURBINE, COMBINED CYCLE, NATURAL GAS	1923 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	30.40 lb/hr		BACT-PSD
PA-0187	GRAYS FERRY COGEN PARTNERSHIP	PHILADELPHIA	PA	3/21/2001	COMBUSTION TURBINE, SIMPLE CYCLE, NATURAL GAS	135 MW	Particulate Matter (PM)	0.0050 lb/MMBtu		BACT-PSD
PA-0187	GRAYS FERRY COGEN PARTNERSHIP	PHILADELPHIA	PA	3/21/2001	COMBUSTION TURBINE, SIMPLE CYCLE, NATURAL GAS	135 MW	Particulate matter, filterable < 10 µ (FPM10)	0.0050 lb/MMBtu		BACT-PSD
PA-0187	GRAYS FERRY COGEN PARTNERSHIP	PHILADELPHIA	PA	3/21/2001	COMBUSTION TURBINE, COMBINED CYCLE, NATURAL GAS	1515 MMBTU/H	Particulate Matter (PM)	0.0100 lb/MMBtu		BACT-PSD
PA-0187	GRAYS FERRY COGEN PARTNERSHIP	PHILADELPHIA	PA	3/21/2001	COMBUSTION TURBINE, COMBINED CYCLE, NATURAL GAS	1515 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	0.0100 lb/MMBtu		BACT-PSD
NC-0085	CP&L ROWAN CO TURBINE FACILITY	ROWAN	NC	3/14/2001	TURBINE, COMBINED CYCLE, NATURAL GAS, (2)	157 MW	Particulate matter, filterable < 10 µ (FPM10)	0.0055 lb/MMBtu		BACT-PSD
AZ-0041	KYRENE GENERATING STATION, SALT RIVER PROJECT	MARICOPA	AZ	3/14/2001	TURBINE, COMBINED CYCLE, DUCT BURNER, NAT GAS	175 MW	Particulate matter, filterable < 10 µ (FPM10)	0.0072 lb/MMBtu		LAER
AR-0043	PINE BLUFF ENERGY LLC	JEFFERSON	AR	2/27/2001	TURBINE, SIMPLE CYCLE	170 MW	Particulate matter, filterable < 10 µ (FPM10)	0.0050 lb/MMBtu		BACT-PSD
AR-0043	PINE BLUFF ENERGY LLC	JEFFERSON	AR	2/27/2001	TURBINE, COMBINED CYCLE, NATURAL GAS	170 MW	Particulate matter, filterable < 10 µ (FPM10)	0.0065 lb/MMBtu		BACT-PSD
WA-0302	GOLDENDALE ENERGY PROJECT	KLICKITAT	WA	2/23/2001	COMBINED CYCLE UNIT (TURBINE/HRSG)	248.7 MW	Particulate matter, filterable < 10 µ (FPM10)	19.00 lb/hr	BASE LOAD	BACT-PSD
AZ-0037	PANDA GILA RIVER	MARICOPA	AZ	2/23/2001	TURBINE, COMBINED CYCLE, DUCT BURNER	170 MW	Particulate matter, filterable < 10 µ (FPM10)	0.0056 lb/MMBtu	3 hr avg	BACT-PSD

Table C-4 Gas Turbine Particulate Matter Emission Limits from EPA'S RACT/BACT/LAER Clearing House (December 2009)

RBLCID	FACILITY NAME	COUNTY	STATE	PERMIT DATE	PROCESS NAME	Size	POLLUTANT	Emission Limit		
AL-0188	TENASKA ALABAMA II GENERATING STATION	AUTAUGA	AL	2/16/2001	THREE (3) COMBINED CYCLE COMBUSTION TURBINE UNITS	170 MW	Particulate matter, filterable < 10 µ (FPM10)	0.0166 lb/MMBtu		BACT-PSD
AZ-0034	HARQUAHALA GENERATING PROJECT	MARICOPA	AZ	2/15/2001	COMBINED CYCLE, NATURAL GAS	2362 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	24.00 lb/hr		Other Case-by-Case
CO-0049	NORTH AMERICAN POWER GP -KIOWA CREEK	ARAPAHOE	CO	1/17/2001	COMBINED-CYCLE GAS TURBINES (4) - GENERATORS	250 MW	Particulate Matter (PM)	0.0136 lb/MMBtu		BACT-PSD
AL-0168	GENPOWER KELLEY LLC	WALKER	AL	1/12/2001	TURBINE, COMBINED CYCLE ELECTRIC GENERATING UNITS	173 MW	Particulate matter, filterable < 10 µ (FPM10)	0.0100 lb/MMBtu		BACT-PSD
AL-0162	AUTAUGAVILLE COMBINED CYCLE PLANT	AUTAUGA	AL	1/8/2001	COMBUSTION TURBINES, COMBINED CYCLE (4)	173 MW	Particulate matter, filterable < 10 µ (FPM10)	0.0090 lb/MMBtu		BACT-PSD
TX-0337	CEDAR BLUFF POWER PROJECT	LIBERTY	TX	12/21/2000	(2) COMBUSTION TURBINES, W/HRSG, STACK1&2	660 MW	Particulate matter, filterable < 10 µ (FPM10)	21.25 lb/hr	EACH UNIT	BACT-PSD
NC-0082	CAROLINA POWER AND LIGHT - RICHMOND CO. FACILITY	RICHMOND	NC	12/21/2000	TURBINES, COMBINED CYCLE, NATURAL GAS, (2)	157 MW	Particulate matter, filterable < 10 µ (FPM10)	0.0055 lb/MMBtu		BACT-PSD
TX-0401	COTTONWOOD ENERGY PROJECT	NEWTON	TX	12/15/2000	COMBUTION TURBINE COMBINED-CYCLE	1336 MW	Particulate matter, filterable < 10 µ (FPM10)	27.10 lb/hr		BACT-PSD
AZ-0035	DUKE ENERGY ARLINGTON VALLEY	MARICOPA	AZ	12/14/2000	TURBINE, COMBINED CYCLE	255 MW	Particulate matter, filterable < 10 µ (FPM10)	27.00 lb/hr		BACT-PSD
TX-0260	PALESTINE ENERGY FACILITY	ANDERSON	TX	12/13/2000	TURBINES, COMBINED CYCLE,& HRSG, (6)	170 MW	Particulate matter, filterable < 10 µ (FPM10)	25.60 lb/hr	EACH	BACT-PSD
AZ-0036	PINNACLE WEST ENERGY CORP./REDHAWK GEN. FACILITY	MARICOPA	AZ	12/2/2000	TURBINE, COMBINED CYCLE, DUCT BURNER	175 MW	Particulate matter, filterable < 10 µ (FPM10)	0.0101 lb/MMBtu		BACT-PSD
MN-0043	XCEL ENERGY, BLACK DOG ELECTRIC GENERATING STATION	DAKOTA	MN	11/17/2000	COMBUSTION TURBINE WITH HRSG	1917 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	29.40 lb/hr		BACT-PSD
NV-0034	LAS VEGAS COGENERATION FACILITY	CLARK	NV	11/13/2000	TURBINE, COMBINED CYCLE	176 MW	Particulate matter, filterable < 10 µ (FPM10)	2.50 lb/hr	EACH	Other Case-by-Case
DE-0016	HAY ROAD POWER COMPLEX UNITS 5-8	NEW CASTLE	DE	10/17/2000	TURBINES (3), POLLUTANTS OTHER THAN NOX	500 MW	Particulate matter, filterable < 10 µ (FPM10)	0.0200 lb/MMBtu	NATURAL GAS	BACT-PSD
SC-0062	SC ELECTRIC AND GAS COMPANY - URQUHART STATION	AIKEN	SC	9/22/2000	TURBINES, COMBINED CYCLE, NATURAL GAS (2)	1795 MMBTU/H	Particulate Matter (PM)	34.00 lb/hr		BACT-PSD
WI-0174	BADGER GENERATING CO LLC	KENOSHA	WI	9/20/2000	COMBUSTION TURBINE, COMBINED CYCLE (4)	2010 MMBTU/H	Particulate Matter (PM)	30.50 lb/hr		BACT-PSD
CA-1050	IDC BELLINGHAM, LLC		CA	9/11/2000	GAS TURBINE: COMBINED CYCLE >= 50 MW	GAS TURBINE, 170 0 MW; STEAM TURBINE 185 MW	Particulate Matter (PM)	0.0080 lb/MMBtu		BACT-PSD
LA-0127	PERRYVILLE	OUACHITA PARISH	LA	8/25/2000	GAS TURBINES (EACH), 4, SIMPLE CYCLE		Particulate matter, filterable < 10 µ (FPM10)	18.00 lb/hr		BACT-PSD
LA-0127	PERRYVILLE	OUACHITA PARISH	LA	8/25/2000	GAS TURBINES IN COMBINED CYCLE MODE, 4	183 MW	Particulate matter, filterable < 10 µ (FPM10)	23.00 lb/hr		BACT-PSD
LA-0127	PERRYVILLE	OUACHITA PARISH	LA	8/25/2000	COMBINED CYCLE GENERATION UNIT (EACH)		Particulate matter, filterable < 10 µ (FPM10)	26.10 lb/hr		BACT-PSD
MS-0064	TPS MCADAMS, LLC	ATTALA	MS	8/16/2000	TURBINES, COMBINED CYCLE (2)	1722 MMBTU/H	Particulate Matter (PM)	23.00 lb/hr	EACH	BACT-PSD
MS-0064	TPS MCADAMS, LLC	ATTALA	MS	8/16/2000	TURBINES, COMBINED CYCLE (2)	1722 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	23.00 lb/hr	EACH	BACT-PSD

Table C-4 Gas Turbine Particulate Matter Emission Limits from EPA'S RACT/BACT/LAER Clearing House (December 2009)

RBLCID	FACILITY NAME	COUNTY	STATE	PERMIT DATE	PROCESS NAME	Size	POLLUTANT	Emission Limit		
AR-0041	TPS - DELL, LLC	MISSISSIPPI	AR	8/8/2000	TURBINE, NATURAL GAS FIRED 2	640 MW	Particulate matter, filterable < 10 µ (FPM10)	0.0210 lb/MMBtu		BACT-PSD
TX-0372	WEST TEXAS ENERGY FACILITY	EL PASO	TX	7/28/2000	(2) GAS TURBINE, NO POWER AUGMENTATION, CASE I	250 MW, EA	Particulate matter, filterable < 10 µ (FPM10)	15.90 lb/hr	EACH	BACT-PSD
TX-0372	WEST TEXAS ENERGY FACILITY	EL PASO	TX	7/28/2000	(2)GAS TURBINES, W/POWER AUGMENTATION, CASE II	250 MW, EA	Particulate matter, filterable < 10 µ (FPM10)	18.20 lb/hr	EACH	BACT-PSD
TX-0326	AES WOLF HOLLOW LP	HOOD	TX	7/20/2000	(2)GAS TURBINES W/OUT HRSG, REDUCE OP, EC-ST1&2	236.3 MW, EA	Particulate matter, filterable < 10 µ (FPM10)	24.30 lb/hr	EACH UNIT	Other Case-by-Case
TX-0326	AES WOLF HOLLOW LP	HOOD	TX	7/20/2000	(2)GAS TURBINES GFRAME W/HRSG, NORMAL OP, EC-ST1&2	807 MW, TOTAL	Particulate matter, filterable < 10 µ (FPM10)	30.10 lb/hr	EACH UNIT	Other Case-by-Case
IN-0092	WHITING CLEAN ENERGY, INC.	LAKE	IN	7/20/2000	TURBINES, COMBUSTION, NATURAL GAS (2)	1735 MMBTU/H	Particulate Matter (PM)	0.0045 lb/MMBtu		BACT-PSD
IN-0092	WHITING CLEAN ENERGY, INC.	LAKE	IN	7/20/2000	TURBINES, COMBUSTION, NAT GAS (2) W/DUCT BURNER	1735 MMBTU/H	Particulate Matter (PM)	0.0045 lb/MMBtu		BACT-PSD
TX-0296	WISE COUNTY POWER	WISE	TX	7/14/2000	(2) COMBUSTION TURBINES, STACK 1 & 2	230 MW, EA	Particulate matter, filterable < 10 µ (FPM10)	39.80 lb/hr	EACH UNIT	BACT-PSD
AL-0165	DECATUR ENERGY CENTER	MORGAN	AL	6/6/2000	TURBINES, (3), COMBINED CYCLE	700 MW	Particulate Matter (PM)	0.0050 lb/MMBtu		BACT-PSD
AZ-0040	APS WEST PHOENIX	MARICOPA	AZ	5/26/2000	TURBINE, COMBINED CYCLE, DUCT BURNER, NAT GAS, CC5	530 MW	Particulate matter, filterable < 10 µ (FPM10)	0.0051 lb/MMBtu	3 h avg	LAER
AZ-0040	APS WEST PHOENIX	MARICOPA	AZ	5/26/2000	TURBINE, COMBINED CYCLE, DUCT BURNER, NAT GAS, CC4	130 MW	Particulate matter, filterable < 10 µ (FPM10)	0.0055 lb/MMBtu		LAER
TX-0325	MIDLOTHIAN ENERGY PROJECT	ELLIS	TX	5/9/2000	(2) NEW TURBINES, STACK 5 & 6	250 MW	Particulate matter, filterable < 10 µ (FPM10)	20.00 lb/hr	EACH UNIT	BACT-PSD
TX-0325	MIDLOTHIAN ENERGY PROJECT	ELLIS	TX	5/9/2000	(4) GAS FUELED TURBINES, STACK 1-4	275 MW	Particulate matter, filterable < 10 µ (FPM10)	24.00 lb/hr	EACH UNIT	BACT-PSD
TX-0325	MIDLOTHIAN ENERGY PROJECT	ELLIS	TX	5/9/2000	ANNUAL LIMITS TURBINES, STACK 1-4	275 MW	Particulate matter, filterable < 10 µ (FPM10)	121.3 lb/hr	EACH UNIT	BACT-PSD
MA-0027	CABOT POWER CORPORATION	SUFFOLK	MA	5/7/2000	TURBINE, COMBINED CYCLE, NATURAL GAS	2493 MMBTU/H	Particulate Matter (PM)	32.00 lb/hr		BACT-PSD
RI-0019	RHODE ISLAND STATE ENERGY CENTER	PROVIDENCE	RI	5/3/2000	TURBINE, COMBINED CYCLE (2)	186 MW	Particulate matter, filterable < 10 µ (FPM10)	0.0090 lb/MMBtu		BACT-PSD
AL-0141	GPC - GOAT ROCK COMBINED CYCLE PLANT	LEE	AL	4/10/2000	(2) NATURAL GAS FIRED COMBINED CYCLE COMB.TURB.	173 MW	Particulate matter, filterable < 10 µ (FPM10)	0.0090 lb/MMBtu		BACT-PSD
AL-0141	GPC - GOAT ROCK COMBINED CYCLE PLANT	LEE	AL	4/10/2000	SIX (6) COMBINED CYCLE ELECTRIC GENERATING UNITS	173 MW	Particulate matter, filterable < 10 µ (FPM10)	0.0090 lb/MMBtu		BACT-PSD
TX-0419	CHANNEL ENERGY FACILITY	HARRIS	TX	3/22/2000	TURBINE, COMBINED CYCLE, AND DUCT BURNER (3)	180 MW	Particulate matter, filterable < 10 µ (FPM10)	29.40 lb/hr	EACH TURBINE/HRSG/DUCT BURNER	BACT-PSD
TX-0273	BASTROP CLEAN ENERGY CENTER	BASTROP	TX	3/21/2000	COMBUSTION TURBINE GENERATORS ONLY (2)	161 MW (68 F CASE) EACH	Particulate matter, filterable < 10 µ (FPM10)	13.20 lb/hr		BACT-PSD
TX-0273	BASTROP CLEAN ENERGY CENTER	BASTROP	TX	3/21/2000	TURBINES AND DUCT BURNERS COMBINED (2)	161 MW	Particulate matter, filterable < 10 µ (FPM10)	16.20 lb/hr	EACH	BACT-PSD
TX-0294	GATEWAY POWER PROJECT	UPSHUR	TX	3/20/2000	(3) COMBUSTION TURBINES, WITHOUT DB, CTG-1,-2,-3	180 MW, EACH	Particulate matter, filterable < 10 µ (FPM10)	19.30 lb/hr	EACH UNIT	BACT-PSD
TX-0294	GATEWAY POWER PROJECT	UPSHUR	TX	3/20/2000	(3) COMBUSTION TURBINES & DUCTBURNERS, CTG-1,-2,-3	170 MW, EACH	Particulate matter, filterable < 10 µ (FPM10)	23.60 lb/hr	EACH UNIT	BACT-PSD
TX-0330	JACK COUNTY POWER PLANT	JACK	TX	3/14/2000	(2) GE-7241FA TURBINES, HRSG-1&-2	520 MW	Particulate matter, filterable < 10 µ (FPM10)	18.00 lb/hr	EACH UNIT	BACT-PSD
TX-0297	EXXON-MOBIL BEAUMONT REFINERY	JEFFERSON	TX	3/14/2000	(3) COMBUSTION TURBINES W/DUCT BURN, 61STK001-003	183 MW, EA TURBINE	Particulate matter, filterable < 10 µ (FPM10)	28.08 lb/hr	EACH UNIT	BACT-PSD

Table C-4 Gas Turbine Particulate Matter Emission Limits from EPA'S RACT/BACT/LAER Clearing House (December 2009)

RBLCID	FACILITY NAME	COUNTY	STATE	PERMIT DATE	PROCESS NAME	Size	POLLUTANT	Emission Limit		
TX-0383	FORNEY PLANT	KAUFMAN	TX	3/6/2000	(6) TURBINES	169.8 MW	Particulate matter, filterable < 10 µ (FPM10)	18.00 lb/hr	EACH	BACT-PSD
AL-0143	AEC - MCWILLIAMS PLANT	COVINGTON	AL	3/3/2000	TURBINES, COMBINED CYCLE COMBUSTION (2 EACH)	166 MW	Particulate matter, filterable < 10 µ (FPM10)	0.0120 lb/MMBtu		BACT-PSD
FL-0186	CITY OF GAINESVILLE REGIONAL UTILITIES	ALACHUA	FL	2/24/2000	ELECTRIC GENERATION, TURBINE, COMBINED CYCLE, GAS	1083 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	5.00 lb/hr		BACT-PSD
TX-0328	BAYTOWN COGENERATION PLANT	CHAMBERS	TX	2/11/2000	(3) TURBINE/HRSGS, CTG1-3	750 MW COMBINED	Particulate matter, filterable < 10 µ (FPM10)	28.30 lb/hr	EACH UNIT	BACT-PSD
TX-0299	KAUFMAN COGEN LP	KAUFMAN	TX	1/31/2000	(2) GAS TURBINES, HRSG-1 & -2	180 MW, EACH	Particulate matter, filterable < 10 µ (FPM10)	18.00 lb/hr	EACH UNIT	BACT-PSD
IL-0091	LSP NELSON ENERGY, LLC	LEE	IL	1/28/2000	TURBINE, COMBINED CYCLE, W DUCT BURNER, NAT GAS	2166 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	46.10 lb/hr	each	BACT-PSD
IL-0091	LSP NELSON ENERGY, LLC	LEE	IL	1/28/2000	TURBINES, SIMPLE CYCLE, NATURAL GAS, (4)	2166 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	0.0191 lb/MMBtu		BACT-PSD
IL-0091	LSP NELSON ENERGY, LLC	LEE	IL	1/28/2000	TURBINE, COMBINED CYCLE, W/O DUCT BURNERS, NAT GAS	2166 MMBTU/H	Particulate matter, filterable < 10 µ (FPM10)	0.0191 lb/MMBtu		BACT-PSD
OK-0050	ONETA GENERATING STA	WAGONER	OK	1/21/2000	COMBUSTION TURBINES, COMBINED CYCLE (4)	170 MW	Particulate matter, filterable < 10 µ (FPM10)	9.00 lb/hr		BACT-PSD
TX-0262	ARCHER GENERATING STATION	ECTOR	TX	1/3/2000	(4) GAS TURBINES, TURBINE ONLY FIRING (4)	170 MW EACH	Particulate matter, filterable < 10 µ (FPM10)	20.30 lb/hr		BACT-PSD
TX-0262	ARCHER GENERATING STATION	ECTOR	TX	1/3/2000	GAS TURBINES (4) WITH HRSG (4) (COMBINED FIRING)	173 MW EACH	Particulate matter, filterable < 10 µ (FPM10)	20.30 lb/hr	EACH, COMBINED	BACT-PSD

Table C-5 Gas Turbine SO_2 Emission Limits from EPA'S RACT/BACT/LAER Clearing House (December 2009)

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	COUNTY	STATE	PERMIT DATE	PROCESS NAME	Size		Emission Limit			CASE-BY-CASE BASIS
*VA-0308	WARREN COUNTY FACILITY	VIRGINIA ELECTRIC AND POWER COMPANY	WARREN	VA	1/14/2008	ELECTRIC GENERATION - SCENARIO 2	1944	MMBTU	0.00020	LB/MMBTU		N/A
*VA-0308	WARREN COUNTY FACILITY	VIRGINIA ELECTRIC AND POWER COMPANY	WARREN	VA	1/14/2008	ELECTRIC GENERATION - SCENARIO 1	1717	MMBTU/H	0.00030	LB/MMBTU		N/A
*VA-0308	WARREN COUNTY FACILITY	VIRGINIA ELECTRIC AND POWER COMPANY	WARREN	VA	1/14/2008	ELECTRIC GENERATION SECNARIO 3	2204	MMBTU/H	0.00030	LB/MMBTU	WITHOUT DUCT BURNER FIRING	N/A
*OK-0129	CHOUTEAU POWER PLANT	ASSOCIATED ELECTRIC COOPERATIVE INC	MAYES	OK	1/23/2009	COMBINED CYCLE COGENERATION >25MW	1882	MMBTU/H	0.00056	LB/MMBTU	3-HR AVG	N/A
TN-0144	HAYWOOD ENERGY CENTER, LLC	CALPINE CONSTRUCTION FINANCE COMPANY, L. P.	HAYWOOD	TN	2/1/2002	TURBINE, COMBINED CYCLE, W/ DUCT FIRING	1990	MMBTU/H	0.00059	LB/MMBTU		BACT-PSD
AR-0043	PINE BLUFF ENERGY LLC	PINE BLUFF ENERGY LLC	JEFFERSON	AR	2/27/2001	TURBINE, SIMPLE CYCLE	170	MW	0.00060	LB/MMBTU		BACT-PSD
AR-0026	PINE BLUFF ENERGY LLC - PINE BLUFF ENERGY CENTER	PINE BLUFF ENERGY LLC - PINE BLUFF ENERGY CENTER	JEFFERSON	AR	5/5/1999	TURBINE, COMBINED CYCLE, NATURAL GAS	170	MW	0.00060	LB/MMBTU		BACT-PSD
AL-0141	GPC - GOAT ROCK COMBINED CYCLE PLANT	GEORGIA POWER COMPANY	LEE	AL	4/10/2000	(2) NATURAL GAS FIRED COMBINED CYCLE COMB.TURB.	173	MW	0.00060	LB/MMBTU		Other Case-by-Case
AR-0043	PINE BLUFF ENERGY LLC	PINE BLUFF ENERGY LLC	JEFFERSON	AR	2/27/2001	TURBINE, COMBINED CYCLE, NATURAL GAS	170	MW	0.00060	LB/MMBTU		BACT-PSD
NC-0082	CAROLINA POWER AND LIGHT - RICHMOND CO. FACILITY	CAROLINA POWER AND LIGHT RICHMOND	RICHMOND	NC	12/21/2000	TURBINES, COMBINED CYCLE, NATURAL GAS, (2)	157	MW	0.00060	LB/MMBTU		BACT-PSD
NC-0085	CP&L ROWAN CO TURBINE FACILITY	CAROLINA POWER AND LIGHT	ROWAN	NC	3/14/2001	TURBINE, COMBINED CYCLE, NATURAL GAS, (2)	157	MW	0.00060	LB/MMBTU		BACT-PSD
NC-0086	FAYETTEVILLE GENERATION, LLC	FAYETTEVILLE GENERATION, LLC	CUMBERLAND	NC	1/10/2002	TURBINE, COMBINED CYCLE, NATURAL GAS, (2)	154	MW	0.00060	LB/MMBTU	3-h avg	BACT-PSD
NC-0101	FORSYTH ENERGY PLANT	FORSYTH ENERGY PROJECTS, LLC	FORSYTH	NC	9/29/2005	TURBINE, COMBINED CYCLE, NATURAL GAS, (3)	1844.3	MMBTU/H	0.00060	LB/MMBTU	based on 3-hour average	BACT-PSD
NC-0101	FORSYTH ENERGY PLANT	FORSYTH ENERGY PROJECTS, LLC	FORSYTH	NC	9/29/2005	TURBINE & DUCT BURNER, COMBINED CYCLE, NAT GAS, 3	1844.3	MMBTU/H	0.00060	LB/MMBTU	3-hr avg	BACT-PSD
TX-0391	OXY COGENERATION FACILITY	OXY VINYLS LP	HARRIS	TX	12/20/2002	HRSG UNIT NO. 3	255	MMBTU/H	0.00078	LB/MMBTU		Other Case-by-Case
PA-0187	GRAYS FERRY COGEN PARTNERSHIP	GRAYS FERRY COGEN PARTNERSHIP	PHILADELPHIA	PA	3/21/2001	COMBUSTION TURBINE, SIMPLE CYCLE, NATURAL GAS	135	MW	0.00080	LB/MMBTU		BACT-PSD
PA-0187	GRAYS FERRY COGEN PARTNERSHIP	GRAYS FERRY COGEN PARTNERSHIP	PHILADELPHIA	PA	3/21/2001	COMBUSTION TURBINE, COMBINED CYCLE, NATURAL GAS	1515	MMBTU/H	0.00080	LB/MMBTU		BACT-PSD
VA-0255	VA POWER - POSSUM POINT	Virginia Power	PRINCE WILLIAM	VA	11/18/2002	TURBINE, NATURAL GAS, NO DUCT BURNER FIRING	1937	MMBTU/H	0.00090	LB/MMBTU		BACT-PSD
NJ-0059	COGEN TECHNOLOGIES LINDEN VENTURE, L.P	LINDEN COGENERATION TECHNOLOGY	UNION	NJ	5/9/2001	COMBUSTION GAS TURBINE(GE): COMBINED CYCLE(THE 6TH UNIT)	1928.2	MMBTU/H	0.00100	LB/MMBTU		Other Case-by-Case
VA-0255	VA POWER - POSSUM POINT	Virginia Power	PRINCE WILLIAM	VA	11/18/2002	TURBINE, COMBINED CYCLE, NATURAL GAS, DUCT BURNER	1937	MMBTU/H	0.00107	LB/MMBTU		BACT-PSD
*NY-0095	CAITHNES BELLPORT ENERGY CENTER	CAITHNESS BELLPORT, LLC	SUFFOLK	NY	5/10/2006	COMBUSTION TURBINE	2221	MMBUT/H	0.00110	LB/MMBTU		BACT-PSD
NJ-0058	PSEG FOSSIL LLC LINDEN GENERATING STATION	PSEG FOSSILL LLC LINDEN GENERATING STATION	UNION	NJ	8/24/2001	COMBUSTION GAS TURBINES(GE 7FA)(4 UNITS): COMBINED CYCLE	1651	MMBTU/H	0.00120	LB/MMBTU		BACT-PSD
MI-0267	RENAISSANCE POWER LLC	RENAISSANCE POWER LLC	MONTCALM	MI	6/7/2001	STATIONARY GAS TURBINES, SIMPLE CYCLE 4 EACH	170	MW	0.00140	LB/H		BACT-PSD
MS-0064	TPS MCADAMS, LLC	TPS MCADAMS. LLC	ATTALA	MS	8/16/2000	TURBINES, COMBINED CYCLE (2)	1722	MMBTU/H	0.00170	LB/MMBTU		BACT-PSD

Table C-5 Gas Turbine SO_2 Emission Limits from EPA'S RACT/BACT/LAER Clearing House (December 2009)

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	COUNTY	STATE	PERMIT DATE	PROCESS NAME	Size		Emission Limit			CASE-BY-CASE BASIS
AL-0168	GENPOWER KELLEY LLC	GENPOWER KELLEY LLC	WALKER	AL	1/12/2001	TURBINE, COMBINED CYCLE ELECTRIC GENERATING UNITS	173	MW	0.00200	LB/MMBTU		BACT-PSD
AR-0041	TPS - DELL, LLC	TPS - DELL, LLC.	MISSISSIPPI	AR	8/8/2000	TURBINE, NATURAL GAS FIRED 2	640	MW	0.00200	LB/MMBTU		BACT-PSD
CA-1050	IDC BELLINGHAM, LLC	IDC BELLINGHAM, LLC		CA	9/11/2000	GAS TURBINE: COMBINED CYCLE >= 50 MW	0	GAS TURBINE, 170 MW; STEAM TURBINE 185 MW	0.00200	LB/MMBTU		BACT-PSD
PA-0188	FAIRLESS ENERGY LLC	FAIRLESS ENERGY LLC	BUCKS	PA	3/28/2002	TURBINE, COMBINED CYCLE	1190	MW	0.00200	LB/MMBTU		Other Case-by-Case
PA-0196	SWEC-FALLS TOWNSHIP	SWEC-FALLS TOWNSHIP	BUCKS	PA	8/7/2001	TURBINE, COMBINED CYCLE, NATURAL GAS	544	MW	0.00200	LB/MMBTU		Other Case-by-Case
AZ-0049	LA PAZ GENERATING FACILITY	ALLEGHENY ENERGY SUPPLY LLC	LA PAZ	AZ	9/4/2003	SIEMENS WESTINGHOUSE COMBUSTION TURBINES AND HEAT RECOVERY STEAM GENERATORS	1080	MW	0.00210	LB/MMBTU	3-HOUR AVERAGE	BACT-PSD
AZ-0049	LA PAZ GENERATING FACILITY	ALLEGHENY ENERGY SUPPLY LLC	LA PAZ	AZ	9/4/2003	GE COMBUSTION TURBINES AND HEAT RECOVERY STEAM GENERATORS	1040	MW	0.00210	LB/MMBTU	3-HR AVERAGE	BACT-PSD
MA-0027	CABOT POWER CORPORATION	CABOT POWER CORPORATION	SUFFOLK	MA	5/7/2000	TURBINE, COMBINED CYCLE, NATURAL GAS	2493	MMBTU/H	0.00220	LB/MMBTU		BACT-PSD
CT-0139	PDC EL PASO MILFORD LLC	PDC EL PASO MILFORD LLC	NEW HAVEN	CT	4/16/1999	TURBINE, COMBUSTION, ABB GT-24, #1 WITH 2 CHILLERS	1.97	MMCF/H	0.00220	LB/MMBTU		BACT-PSD
CT-0140	PDC EL PASO MILFORD LLC	PDC EL PASO MILFORD LLC	NEW HAVEN	CT	4/16/1999	TURBINE, COMBUSTION, ABB GT-24E,#2 WITH 2 CHILLERS	1.97	MMCF/H	0.00220	LB/MMBTU		BACT-PSD
WI-0174	BADGER GENERATING CO LLC	BADGER GENERATING CO LLC	KENOSHA	WI	9/20/2000	COMBUSTION TURBINE, COMBINED CYCLE (4)	2010	MMBTU/H	0.00224	LB/MMBTU		BACT-PSD
MA-0024	ANP BLACKSTONE ENERGY COMPANY	ANP BLACKSTONE ENERGY COMPANY	WORCESTER	MA	4/16/1999	TURBINE, COMBINED CYCLE, NATURAL GAS, (2)	3630	MMBTU/H	0.00230	LB/MMBTU		BACT-PSD
MA-0025	ANP BELLINGHAM ENERGY COMPANY	ANP BELLINGHAM ENERGY COMPANY	NORFOLK	MA	8/4/1999	TURBINES, COMBINED CYCLE, NATURAL GAS, (2)	3630	MMBTU/H	0.00230	LB/MMBTU		BACT-PSD
AZ-0047	WELLTON MOHAWK GENERATING STATION	DOME VALLEY ENERGY PARTNERS	YUMA	AZ	12/1/2004	COMBUSTION TURBINE GENERATORS AND HEAT RECOVERY STEAM GENERATORS - GE7FA TURBINES OPTION	170	MW	0.00230	LB/MMBTU	3-HOUR AVERAGE	BACT-PSD
AZ-0047	WELLTON MOHAWK GENERATING STATION	DOME VALLEY ENERGY PARTNERS	YUMA	AZ	12/1/2004	COMBUSTION TURBINE GENERATORS AND HEAT RECOVERY STEAM GENERATORS - SW501F TURBINES OPTION	180	MW	0.00230	LB/MMBTU	3-HOUR AVERAGE	BACT-PSD
NH-0011	AES LONDONDERRY, LLC	AES LONDONDERRY, LLC	ROCKINGHAM	NH	4/26/1999	TURBINE, COMBINED CYCLE, NAT GAS, #1 & #2	2849	MMBTU/H	0.00230	LB/MMBTU		BACT-PSD
AZ-0034	HARQUAHALA GENERATING PROJECT	HARQUAHALA GENERATING CO.	MARICOPA	AZ	2/15/2001	COMBINED CYCLE, NATURAL GAS	2362	MMBTU/H	0.00246	LB/MMBTU		Other Case-by-Case
NJ-0044	MANTUA CREEK GENERATING FACILITY	MANTUA CREEK GENERATING FACILITY	GLOUCESTER	NJ	6/26/2001	COMBUSTION TURBINE WITHOUT DUCT BURNER, 60% LOAD			0.00250	LB/MMBTU		N/A
NJ-0044	MANTUA CREEK GENERATING FACILITY	MANTUA CREEK GENERATING FACILITY	GLOUCESTER	NJ	6/26/2001	COMBUSTION TURBINE WITHOUT DUCT BURNER, 75% LOAD			0.00250	LB/MMBTU		N/A
NJ-0044	MANTUA CREEK GENERATING FACILITY	MANTUA CREEK GENERATING FACILITY	GLOUCESTER	NJ	6/26/2001	COMBUSTION TURBINE WITHOUT DUCT BURNER			0.00250	LB/MMBTU		N/A
NJ-0044	MANTUA CREEK GENERATING FACILITY	MANTUA CREEK GENERATING FACILITY	GLOUCESTER	NJ	6/26/2001	COMBUSTION TURBINE WITH DUCT BURNER (3)	2181	MMBTU/H	0.00250	LB/MMBTU		N/A
PA-0192	LOWER MOUNT BETHEL ENERGY, LLC	LOWER MOUNT BETHEL ENERGY, LLC	NORTHHAMPTON	PA	10/20/2001	TURBINE, COMBINED CYCLE, (2)	370	MW	0.00270	PPMVD		LAER

Table C-5 Gas Turbine SO_2 Emission Limits from EPA'S RACT/BACT/LAER Clearing House (December 2009)

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	COUNTY	STATE	PERMIT DATE	PROCESS NAME	Size		Emission Limit			CASE-BY-CASE BASIS
PA-0228	SPRINGDALE TOWNSHIP STATION	ALLEGHENY ENERGY SUPPLY CO., L.L.C.	ALLEGHENY	PA	7/12/2001	TURBINE, COMBINED CYCLE	2094	MMBTU/H	0.00272	LB/MMBTU		BACT-PSD
IN-0086	MIRANT SUGAR CREEK, LLC	MIRANT SUGAR CREEK, LLC	VIGO	IN	5/9/2001	TURBINE, NATURAL GAS, SIMPLE CYCLE, FOUR	170	MW	0.00280	LB/MMBTU		BACT-PSD
IN-0114	MIRANT SUGAR CREEK LLC	MIRANT SUGAR CREEK LLC	VIGO	IN	7/24/2002	TURBINES, SIMPLE CYCLE, NATURAL GAS, (4)	1490.5	MMBTU/H	0.00280	LB/MMBTU		BACT-PSD
IN-0114	MIRANT SUGAR CREEK LLC	MIRANT SUGAR CREEK LLC	VIGO	IN	7/24/2002	TURBINE, COMBINED CYCLE, NATURAL GAS (4)	1490.5	MMBTU/H	0.00280	LB/MMBTU		BACT-PSD
NM-0044	CLOVIS ENERGY FACILITY	DUKE ENERGY CURRY LLC	CURRY	NM	6/27/2002	TURBINES, COMBINED CYCLE, NATURAL GAS (4)	1515	MMBTU/H	0.00284	LB/MMBTU		BACT-PSD
MA-0029	SITHE MYSTIC DEVELOPMENT LLC	SITHE MYSTIC DEVELOPMENT LLC	SUFFOLK	MA	9/29/1999	TURBINE, COMBINED CYCLE, NATURAL GAS (2)	2699	MMBTU/H	0.00290	LB/MMBTU		BACT-PSD
IN-0114	MIRANT SUGAR CREEK LLC	MIRANT SUGAR CREEK LLC	VIGO	IN	7/24/2002	TURBINE, COMBINED CYCLE AND DUCT BURNER, NAT GAS	1490.5	MMBTU/H	0.00295	LB/MMBTU		BACT-PSD
DE-0016	HAY ROAD POWER COMPLEX UNITS 5-8	CONECTIV ENERGY, INC.	NEW CASTLE	DE	10/17/2000	TURBINES (3), POLLUTANTS OTHER THAN NOX	500	MW	0.00300	LB/MMBTU		BACT-PSD
OK-0096	REDBUD POWER PLANT	REDBUD ENERGY LP	OKLAHOMA	OK	6/3/2003	COMBUSTION TURBINE AND DUCT BURNERS	1832	MMBTU/H	0.00300	LB/MMBTU		BACT-PSD
ID-0010	MIDDLETON FACILITY	GARNET ENERGY LLC	CANYON	ID	10/19/2001	(2) GAS TURBINES WITH DUCT BURNERS, NAT GAS	2097	MMBTU/H	0.00310	LB/MMBTU		BACT-PSD
TX-0391	OXY COGENERATION FACILITY	OXY VINYLS LP	HARRIS	TX	12/20/2002	HRSG UNITS 1 & 2 (2)	255	MMBTU/H	0.00329	LB/MMBTU		BACT-PSD
IN-0095	ALLEGHENY ENERGY SUPPLY CO. LLC	ALLEGHENY ENERGY SUPPLY CO. LLC (ACADIA BAY ENERGY	ST. JOSEPH	IN	12/7/2001	2 CMBND CYCLE COMBUST. TURBINE WESTINGHOUSE 501F	2071	MMBTU/H (HHV)	0.00340	LB/MMBTU		BACT-PSD
IN-0092	WHITING CLEAN ENERGY, INC.	WHITING CLEAN ENERGY, INC.	LAKE	IN	7/20/2000	TURBINES, COMBUSTION, NAT GAS (2) W/DUCT BURNER	1735	MMBTU/H	0.00346	LB/MMBTU		BACT-PSD
IN-0095	ALLEGHENY ENERGY SUPPLY CO. LLC	ALLEGHENY ENERGY SUPPLY CO. LLC (ACADIA BAY ENERGY	ST. JOSEPH	IN	12/7/2001	TWO SIMPLE CYCLE COMBUSTION TURBINES GELM6000	469	MMBTU/H	0.00350	LB/MMBTU		BACT-PSD
NH-0012	NEWINGTON ENERGY LLC	NEWINGTON ENERGY LLC	ROCKINGAM	NH	4/26/1999	TURBINES, COMBINED CYCLE, NATURAL GAS	160	MW	0.00360	LB/MMBTU	gas, 3 hr roll avg	BACT-PSD
WA-0299	SUMAS ENERGY 2 GENERATION FACILITY	SUMAS ENERGY 2, INC.	WHATCOM	WA	9/6/2002	TURBINES, COMBINED CYCLE, (2)	334.5	MW	0.00380	LB/MMBTU	1 h avg	BACT-PSD
NJ-0043	LIBERTY GENERATING STATION	LIBERTY GENERATING STATION	UNION	NJ	3/28/2002	COMBINED CYCLE TURBINE (3)	2964	MMBTU/H	0.00400	LB/MMBTU		Other Case-by-Case
NJ-0043	LIBERTY GENERATING STATION	LIBERTY GENERATING STATION	UNION	NJ	3/28/2002	COMBINED CYCLE TURBINE WITH DUCT BURNER	3202	MMBTU/H	0.00400	LB/MMBTU		Other Case-by-Case
TN-0144	HAYWOOD ENERGY CENTER, LLC	CALPINE CONSTRUCTION FINANCE COMPANY, L. P.	HAYWOOD	TN	2/1/2002	TURBINE, COMBINED CYCLE, W/O DUCT FIRING	1990	MMBTU/H	0.00492	LB/MMBTU		BACT-PSD
OK-0045	REDBUD POWER PLT	REDBUD ENERGY LP	OK	OK	8/15/2001	TURBINE, COMBINED CYCLE, (4)	1698	MMBTU/H	0.00500	LB/MMBTU		BACT-PSD
OK-0046	THUNDERBIRD POWER PLT	THUNDERBIRD GENERATION LLC	CLEVELAND	OK	5/17/2001	TURBINES, COMBINED CYCLE, (3)	1698	MMBTU/H	0.00500	LB/MMBTU		BACT-PSD
LA-0192	CRESCENT CITY POWER	CRESENT CITY POWER, LLC	ORLEANS	LA	6/6/2005	GAS TURBINES - 187 MW (2)	2006	MMBTU/H	0.00503	LB/MMBTU	HOURLY MAXIMUM	BACT-PSD
RI-0019	RHODE ISLAND STATE ENERGY CENTER	FPLE RHODE ISLAND STATE ENERGY, L.P.	PROVIDENCE	RI	5/3/2000	TURBINE, COMBINED CYCLE (2)	186	MW	0.00540	LB/MMBTU		BACT-PSD
TX-0351	WEATHERFORD ELECTRIC GENERATION FACILITY	SEI TEXAS LLC	PARKER	TX	3/11/2002	(2) GE 7241FA GAS TURBINES (TEMP STACK), S-1&2	1910	MMBTU/H	0.00550	LB/MMBTU		N/A
TX-0351	WEATHERFORD ELECTRIC GENERATION FACILITY	SEI TEXAS LLC	PARKER	TX	3/11/2002	(2) GE7121EA GAS TURBINES, S-3&4	1079	MMBTU/H	0.00556	LB/MMBTU		N/A

Table C-5 Gas Turbine SO_2 Emission Limits from EPA'S RACT/BACT/LAER Clearing House (December 2009)

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	COUNTY	STATE	PERMIT DATE	PROCESS NAME	Size		Emission Limit			CASE-BY-CASE BASIS
PA-0160	CALPINE CONSTRUCTION FINANCE CO., LP	CALPINE CONSTRUCTION FINANCE CO., LP	BERKS	PA	10/10/2000	TURBINE, COMBINED CYCLE, NATURAL GAS	182	MW	0.00560	LB/MMBTU		Other Case-by-Case
OK-0056	HORSESHOE ENERGY PROJECT	MUSTANG POWER LLC	LINCOLN	OK	2/12/2002	TURBINES AND DUCT BURNERS	310	MW TOTAL	0.00560	LB/MMBTU		BACT-PSD
OH-0248	LAWRENCE ENERGY	CALPINE CORPORATION	LAWRENCE	OH	9/24/2002	TURBINES (3), COMBINED CYCLE, DUCT BURNERS ON	180	MW	0.00570	LB/MMBTU	with duct burner	BACT-PSD
OH-0248	LAWRENCE ENERGY	CALPINE CORPORATION	LAWRENCE	OH	9/24/2002	TURBINES (3), COMBINED CYCLE, DUCT BURNERS OFF	180	MW	0.00570	LB/MMBTU		BACT-PSD
OH-0263	FREMONT ENERGY CENTER, LLC	CALPINE CORPORATION	SANDUSKY	OH	8/9/2001	COMBUSTION TURBINES (2), COMB CYCLE W DUCT BURNER	180	MW	0.00570	LB/MMBTU		BACT-PSD
OH-0263	FREMONT ENERGY CENTER, LLC	CALPINE CORPORATION	SANDUSKY	OH	8/9/2001	COMBUSTION TURBINES(2), COMB CYCLE W/O DUCT BURNER	180	MW	0.00570	LB/MMBTU		BACT-PSD
AL-0180	DUKE ENERGY DALE, LLC	DUKE ENERGY DALE, LLC	DALE	AL	12/11/2001	2 GE 7FA GAS FIRED COMB. CYCLE W/568 MMBTU DUCT B	170	MW EACH	0.00570	LB/MMBTU		BACT-PSD
IN-0087	DUKE ENERGY, VIGO LLC	DUKE ENERGY, VIGO LLC	VIGO	IN	6/6/2001	TURBINE, NATURAL GAS, COMBINED CYCLE (2)	170	MW	0.00570	LB/MMBTU		BACT-PSD
VA-0287	JAMES CITY ENERGY PARK	JAMES CITY ENERGY PARK LLC	JAMES CITY	VA	12/1/2003	TURBINE, COMBINED CYCLE, NATURAL GAS,DUCT BURNER	1973	MMBTU/H	0.00570	LB/MMBTU		BACT-PSD
LA-0224	ARSENAL HILL POWER PLANT	SOUTHWEST ELECTRIC POWER COMPANY (SWEPCO)	CADDO	LA	3/20/2008	TWO COMBINED CYCLE GAS TURBINES	2110	MMBTU/H	0.00570	LB/MMBTU		BACT-PSD
VA-0287	JAMES CITY ENERGY PARK	JAMES CITY ENERGY PARK LLC	JAMES CITY	VA	12/1/2003	TURBINE, COMBINED CYCLE, NATURAL GAS	1973	MMBTU/H	0.00580	LB/MMBTU		BACT-PSD
AR-0057	TENASKA ARKANSAS PARTNERS, LP	TENASKA ARKANSAS PARTNERS, LP	LONOKE	AR	10/9/2001	TURBINE, COMBINED CYCLE, NATURAL GAS	185	MW	0.00600	LB/MMBTU	100% LOAD	BACT-PSD
IN-0110	COGENTRIX LAWRENCE CO., LLC	COGENTRIX LAWRENCE CO., LLC	LAWRENCE	IN	10/5/2001	TURBINES, COMBINED CYCLE, (3)	1944.1	MMBTU/H	0.00600	LB/MMBTU		BACT-PSD
IL-0091	LSP NELSON ENERGY, LLC	LSP NELSON ENERGY, LLC	LEE	IL	1/28/2000	TURBINES, SIMPLE CYCLE, NATURAL GAS, (4)	2166	MMBTU/H	0.00600	LB/MMBTU		BACT-PSD
VA-0260	HENRY COUNTY POWER	Cogentrix Energy Inc	HENRY	VA	11/21/2002	TURBINE, COMBINED CYCLE, (4), 100% LOAD	171	MW	0.00600	LB/MMBTU		BACT-PSD
IN-0110	COGENTRIX LAWRENCE CO., LLC	COGENTRIX LAWRENCE CO., LLC	LAWRENCE	IN	10/5/2001	TURBINES, COMBINED CYCLE, & DUCT BURNERS, (3)	1944.1	MMBTU/H	0.00600	LB/MMBTU		BACT-PSD
IL-0091	LSP NELSON ENERGY, LLC	LSP NELSON ENERGY, LLC	LEE	IL	1/28/2000	TURBINE, COMBINED CYCLE, W/O DUCT BURNERS, NAT GAS	2166	MMBTU/H	0.00600	LB/MMBTU		BACT-PSD
OK-0051	GREEN COUNTRY ENERGY PROJECT	COGENTRIX ENERGY INC	TULSA	OK	10/1/1999	TURBINES WITH DUCT BURNERS, COMBINED CYCLE, (3)			0.00600	LB/MMBTU		BACT-PSD
OK-0090	DUKE ENERGY STEPHENS, LLC STEPHENS ENERGY	DUKE ENERGY	STEPHENS	OK	3/21/2003	TURBINES, COMBINED CYCLE (2)	1701	MMBTU/H	0.00600	LB/MMBTU		BACT-PSD
CA-0950	VALERO REFINING COMPANY	VALERO ENERGY CORPORATION	SOLANO COUNTY	CA	1/11/2000	COMBUSTION TURBINE, COMBINED CYCLE, (2)	102	MW	0.00690	LB/MMBTU		LAER
AL-0185	BARTON SHOALS ENERGY	BARTON SHOALS ENERGY, LLC	COLBERT	AL	7/12/2002	FOUR (4) COMBINED CYCLE COMBUSTION TURBINE UNITS	173	MW	0.00700	LB/MMBTU		BACT-PSD
PA-0179	SWEC LLC	SWEC LLC	BUCKS	PA	8/7/2001	TURBINE, NATURAL GAS FIRED	0		0.00710	LB/MMBTU		Other Case-by-Case
MS-0044	CALEDONIA POWER LLC	CALEDONIA POWER LLC	LOWNDES	MS	3/27/2001	ELECTRIC POWER GENERATION, TURBINE & DUCT BURNER	1700	MMBTU/H	0.00710	LB/MMBTU		Other Case-by-Case
MS-0065	LONE OAK ENERGY CENTER, LLC	LONE OAK ENERGY CENTER, LLC	LOWNDES	MS	11/13/2001	AA-001 COMBUSTION TURBINE, COMBINED CYCLE	1837	MMBTU/H	0.00710	LB/MMBTU		BACT-PSD
MS-0065	LONE OAK ENERGY CENTER, LLC	LONE OAK ENERGY CENTER, LLC	LOWNDES	MS	11/13/2001	AA-002 COMBUSTION TURBINE, COMBINED CYCLE	1837	MMBTU/H	0.00710	LB/MMBTU		BACT-PSD

Table C-5 Gas Turbine SO_2 Emission Limits from EPA'S RACT/BACT/LAER Clearing House (December 2009)

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	COUNTY	STATE	PERMIT DATE	PROCESS NAME	Size		Emission Limit			CASE-BY-CASE BASIS
MS-0065	LONE OAK ENERGY CENTER, LLC	LONE OAK ENERGY CENTER, LLC	LOWNDES	MS	11/13/2001	AA-003 COMBUSTION TURBINE, COMBINED CYCLE	1837	MMBTU/H	0.00710	LB/MMBTU		BACT-PSD
MS-0051	LSP- BATESVILLE GENERATION FACILITY	LSP LIMITED PARTNERSHIP, BATESVILLE GENERATION	PANOLA	MS	11/13/2001	COMBINED CYCLE COMBUSTION TURBINE GENERATION (CTG)	2100	MMBTU/H	0.00714	LB/MMBTU		BACT-PSD
IL-0091	LSP NELSON ENERGY, LLC	LSP NELSON ENERGY, LLC	LEE	IL	1/28/2000	TURBINE, COMBINED CYCLE, W DUCT BURNER, NAT GAS	2166	MMBTU/H	0.00720	LB/MMBTU		BACT-PSD
MS-0059	PIKE GENERATION FACILITY	LSP-PIKE ENERGY, LLC	PIKE	MS	9/24/2002	TURBINE AA-001 W/DUCT BURNER	2168	MMBTU/H	0.00720	LB/MMBTU		BACT-PSD
MS-0059	PIKE GENERATION FACILITY	LSP-PIKE ENERGY, LLC	PIKE	MS	9/24/2002	TURBINE, AA-002 W /DUCT BURNER	2168	MMBTU/H	0.00720	LB/MMBTU		BACT-PSD
MS-0059	PIKE GENERATION FACILITY	LSP-PIKE ENERGY, LLC	PIKE	MS	9/24/2002	TURBINE, AA-003 /DUCT BURNER	2168	MMBTU/H	0.00720	LB/MMBTU		BACT-PSD
MS-0059	PIKE GENERATION FACILITY	LSP-PIKE ENERGY, LLC	PIKE	MS	9/24/2002	TURBINE AA-004 W/ DUCT BURNER	2168	MMBTU/H	0.00720	LB/MMBTU		BACT-PSD
MS-0055	EL PASO MERCHANT ENERGY CO.	EL PASO MERCHANT ENERGY CO.	COAHOMA	MS	6/24/2002	TURBINE, COMBINED CYCLE, DUCT BURNER, NAT GAS, (2)	1737	MMBTU/H	0.00720	LB/MMBTU		BACT-PSD
VA-0261	CPV CUNNINGHAM CREEK	COMPETITIVE POWER VENTURE	FLUVANNA	VA	9/6/2002	TURBINE, COMBINED CYCLE, (2)	2132	MMBTU/H	0.01190	LB/MMBTU		BACT-PSD
AL-0132	TENASKA ALABAMA GENERATING STATION	TENASKA ALABAMA GENERATING STATION	AUTAUGA	AL	11/29/1999	TURBINE & DUCT BURNER, NAT GAS, (3)	170	MW	0.01400	LB/MMBTU		BACT-PSD
LA-0136	PLAQUEMINE COGENERATION FACILITY	THE DOW CHEMICAL COMPANY	IBERVILLE	LA	7/23/2008	(4) GAS TURBINES/DUCT BURNERS	2876	MMBTU/H	0.01415	LB/MMBTU	HOURLY MAXIMUM	BACT-PSD
IN-0085	PSEG LAWRENCEBURG ENERGY FACILITY	PSEG LAWRENCEBURG ENERGY FACILITY	DEARBORN	IN	6/7/2001	TURBINE, NATURAL GAS, COMBINED CYCLE FOUR	476.6	MMBTU/H	0.02300	LB/MMBTU		BACT-PSD
MI-0361	SOUTH SHORE POWER LLC	SOUTH SHORE POWER LLC	BERRIEN	MI	1/30/2003	TURBINE, COMBINED CYCLE, (2)	172	MW	0.20	GR/100 SCF	NATURAL GAS SPECIFICATION	BACT-PSD
MI-0362	MIDLAND COGENERATION (MCV)	MIDLAND COGENERATION VENTURE LIMITED PARTNERSHIP	MIDLAND	MI	4/21/2003	TURBINE, COMBINED CYCLE, (11)	984	MMBTU/H	0.20	GR/100 SCF	NATURAL GAS SPECIFICATION	BACT-PSD
VA-0262	MIRANT AIRSIDE INDUSTRIAL PARK	MIRANT DANVILLE, LLC	PITTSYLVANIA	VA	12/6/2002	TURBINE, SIMPLE CYCLE, (4)	84	MW	0.80	GR/100 DSCF	FUEL LIMIT	BACT-PSD
VA-0262	MIRANT AIRSIDE INDUSTRIAL PARK	MIRANT DANVILLE, LLC	PITTSYLVANIA	VA	12/6/2002	TURBINE, COMBINED CYCLE, (2)	170	MW	0.80	GR/100 DSCF	FUEL LIMIT	BACT-PSD
MN-0054	MANKATO ENERGY CENTER		BLUE EARTH	MN	12/4/2003	COMBUSTION TURBINE, LARGE, 2 EACH	1916	MMBTU/H	0.80	GR/100SCF	CALENDAR YEAR AVG.	BACT-PSD
MN-0053	FAIRBAULT ENERGY PARK	MN MUNICIPAL POWER AGENCY	RICE	MN	7/15/2004	TURBINE, COMBINED CYCLE, NATURAL GAS (1)	1876	MMBTU/H	0.80	GR/SCF	gr/scf nat gas, CALENDAR YR AVE	BACT-PSD
CA-0997	SACRAMENTO MUNICIPAL UTILITY DISTRICT	SACRAMENTO MUNICIPAL UTILITY DISTRICT	SACRAMENTO COUNTY	CA	9/1/2003	GAS TURBINES, (2)	1611	MMBTU/H	1.00	GR/100 SCF	FUEL SPECIFICATION	LAER
FL-0124	OLEANDER POWER PROJECT	OLEANDER POWER PROJECT	BREVARD	FL	11/22/1999	TURBINE-GAS, COMBINED CYCLE, NAT GAS	190	MW	1.00	GR/100SCF		BACT-PSD
AR-0052	THOMAS B. FITZHUGH GENERATING STATION	ARKANSAS ELECTRIC CO-OP	FRANKLIN	AR	2/15/2002	TURBINE, COMBINED CYCLE, NATURAL GAS	170.6	MW	1	PPM @ 15% 02		BACT-PSD
WA-0315	SUMAS ENERGY 2 GENERATION FACILITY	SUMAS ENERGY 2 GENERATION FACILITY	WHATCOM	WA	4/17/2003	TURBINES, COMBINED CYCLE, (2)	660	MW	1	PPMVD	1 h avg	BACT-PSD

Table C-5 Gas Turbine SO_2 Emission Limits from EPA'S RACT/BACT/LAER Clearing House (December 2009)

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	COUNTY	STATE	PERMIT DATE	PROCESS NAME	Size		Emission Limit			CASE-BY-CASE BASIS
FL-0233	OUC STANTON ENERGY CENTER	ORLANDO UTILITIES COMMISSION (OUC)	ORANGE	FL	9/21/2001	TURBINE, COMBINED CYCLE, NATURAL GAS, (2)	2402	MMBTU/H	1.5	GR/100CF	fuel limit - grains s per 100 cf	BACT-PSD
PA-0223	DUKE ENERGY FAYETTE, LLC	DUKE ENERGY FAYETTE, LLC	FAYETTE	PA	1/30/2002	TURBINE, COMBINED CYCLE, (2)	280	MW	1.6	PPMVD @ 15% O2		BACT-PSD
FL-0286	FPL WEST COUNTY ENERGY CENTER	FLORIDA POWER AND LIGHT COMPANY	PALM BEACH	FL	1/10/2007	COMBINED CYCLE COMBUSTION GAS TURBINES - 6 UNITS	2333	MMBTU/H	2.0	G S/100 SCF OF GAS		BACT-PSD
FL-0303	FPL WEST COUNTY ENERGY CENTER UNIT 3	FLORIDA POWER AND LIGHT COMPANY (FP&L)	PALM BEACH COUNTY	FL	7/30/2008	THREE NOMINAL 250 MW CTG (EACH) WITH SUPPLEMENTARY-FIRED HRSG	2333	MMBTU/H	2.0	GR S/100 SCF		BACT-PSD
FL-0263	FPL TURKEY POINT POWER PLANT	FLORIDA POWER AND LIGHT	DADE	FL	2/8/2005	170 MW COMBUSTION TURBINE, 4 UNITS	170	MW	2.0	GR S/100 SCF GAS		BACT-PSD
FL-0304	CANE ISLAND POWER PARK	FLORIDA MUNICIPAL POWER AGENCY (FMPA	OSCEOLA	FL	9/8/2008	300 MW COMBINED CYCLE COMBUSTION TURBINE	1860	MMBTU/H	2.0	GR S/100 SCF OF GAS		BACT-PSD
FL-0245	FPL MANATEE PLANT - UNIT 3	FLORIDA POWER & LIGHT	MANATEE	FL	4/15/2003	TURBINE, SIMPLE CYCLE, NATURAL GAS, (4)	170	MW	2.0	GR/100 SCF		BACT-PSD
FL-0245	FPL MANATEE PLANT - UNIT 3	FLORIDA POWER & LIGHT	MANATEE	FL	4/15/2003	TURBINE, COMBINED CYCLE, NATURAL GAS (4)	170	MW	2.0	GR/100 SCF		BACT-PSD
FL-0285	PROGRESS BARTOW POWER PLANT	PROGRESS ENERGY FLORIDA (PEF)	PINELLAS	FL	1/26/2007	SIMPLE CYCLE COMBUSTION TURBINE (ONE UNIT)	1972	MMBTU/H	2.0	GR/100SCF		BACT-PSD
FL-0285	PROGRESS BARTOW POWER PLANT	PROGRESS ENERGY FLORIDA (PEF)	PINELLAS	FL	1/26/2007	COMBINED CYCLE COMBUSTION TURBINE SYSTEM (4-ON-1)	1972	MMBTU/H	2.0	GR/100SCF		BACT-PSD
FL-0239	JEA/BRANDY BRANCH	JACKSONVILLE ELECTRIC AUTHORITY (JEA)	DUVAL	FL	3/27/2002	TURBINES, COMBINED CYCLE, (2)	1911	MMBTU/H	2.0	GR/100SCF		Other Case-by-Case
FL-0123	DUKE ENERGY NEW SMYRNA BEACH POWER CO. LP	DUKE ENERGY NEW SMYRNA BEACH POWER CO. LP	VOLUSIA	FL	10/15/1999	TURBINE-GAS, COMBINED CYCLE	500	MW (2 UNITS)	2.0	GR/100SCF		BACT-PSD
FL-0265	HINES POWER BLOCK 4	PROGRESS ENERGY	POLK	FL	6/8/2005	COMBINED CYCLE TURBINE	530	MW	2.0	GR/100SCF	CONTINUOUS	BACT-PSD

Table C-6 NO_x Emission Limits for Boilers <250 MMBtu/hr from EPA'S RACT/BACT/LAER Clearing House (December 2009)

RBLCID	FACILITY NAME	COUNTY	STATE	PERMIT DATE	PROCESS NAME	Size	Control Device description	CASE-BY-CASE BASIS	Emission Limit	
TX-0499	SANDY CREEK ENERGY STATION	MCLENNAN	TX	7/24/2006	AUXILLARY BOILER	175.00 MMBTU/H		BACT-PSD	0.010 LB/MMBTU	CALCULATED, NOT PERMIT LIMIT
OR-0046	TURNER ENERGY CENTER, LLC	MARION	OR	1/6/2005	AUXILIARY BOILER	48.00 MMBTU/YR	SELECTIVE CATALYTIC REDUCTION	BACT-PSD	0.011 LB/MMBTU	
PA-0193	MERCK AND COMPANY - WEST POINT PLANT	MONTGOMERY	PA	8/26/1999	BOILER, NATURAL GAS, (2)	249.00 MMBTU/H	LOW NOX BURNERS, FLUE GAS RECIRCULATION, AND SELECTIVE CATALYTIC REDUCTION	LAER	0.012 lb/MMBtu	
*AL-0230	THYSSENKRUPP STEEL AND STAINLESS USA, LLC	MOBILE	AL	8/17/2007	3 NATURAL GAS-FIRED BOILERS WITH ULNB & EGR (537-539)	64.90 MMBTU each	ULNB & EGR (ULTRA-LOW NOX BURNERS (ULNB)(EXHAUST GAS RECIRCULATION (EGR) – SAME FLUE GAS RECIRCULATION (FGR)	BACT-PSD	0.012 lb/MMBtu	
MN-0076	BLANDIN PAPER/RAPIDS ENERGY CENTER	ITASCA	MN	9/18/2008	BOILER	280.00 MMBTU/H	FLUE GAS RECIRCULATION WITH LOW-NOX BURNERS	Other Case-by-Case	0.012 lb/MMBtu	
*NV-0049	HARRAH'S OPERATING COMPANY, INC.	CLARK	NV	8/20/2009	BOILER - UNIT HA08	8.37 MMBTU/H	EQUIPPED WITH A LOW-NOX BURNER	BACT-PSD	0.015 LB/MMBTU	
*ID-0017	POWER COUNTY ADVANCED ENERGY CENTER	POWER	ID	2/10/2009	250 MMBTU/H PACKAGE BOILER, SRC24	250.00 MMBTU/H	LOW-NOX BURNER AND FGR	BACT-PSD	0.020 lb/MMBtu	
*NV-0049	HARRAH'S OPERATING COMPANY, INC.	CLARK	NV	8/20/2009	BOILER - UNIT CP01	35.40 MMBTU/H	LOW NOX BURNER	BACT-PSD	0.035 LB/MMBTU	
NJ-0036	AES RED OAK LLC	MIDDLESEX	NJ	10/24/2001	AUXILIARY BOILER	120.00 MMBTU/H	LIMITED OPERATION OF 3600 H/YR	LAER	0.036 LB/MMBTU	
IN-0085	PSEG LAWRENCEBURG ENERGY FACILITY	DEARBORN	IN	6/7/2001	AUXILIARY BOILER, NATURAL GAS	124.60 MMBTU/H	LOW NOX BURNERS. NATURAL GAS ONLY	BACT-PSD	0.036 LB/MMBTU	
NJ-0043	LIBERTY GENERATING STATION	UNION	NJ	3/28/2002	AUXILIARY BOILER	200.00 MMBTU/H	SCR	Other Case-by-Case	0.036 LB/MMBTU	
*NV-0049	HARRAH'S OPERATING COMPANY, INC.	CLARK	NV	8/20/2009	BOILER - UNIT PA15	21.00 MMBTU/H	LOW NOX BURNER	BACT-PSD	0.037 LB/MMBTU	
AR-0026	PINE BLUFF ENERGY LLC - PINE BLUFF ENERGY CENTER	JEFFERSON	AR	5/5/1999	BOILER, NATURAL GAS	362.00 MMBTU/H	LOW NOX BURNERS, FLUE GAS RECIRCULATION, AND GOOD COMBUSTION PRACTICES.	BACT-PSD	0.037 LB/MMBTU	
AR-0070	GENOVA ARKANSAS I, LLC	WASHINGTON	AR	8/23/2002	AUXILIARY BOILER	33.00 MMBTU/H	LOW NOX OPTION (LOW NOX BURNER AND/OR FLUE GAS RECIRCULATION)	BACT-PSD	0.040 LB/MMBTU	

Table C-6 NO_x Emission Limits for Boilers <250 MMBtu/hr from EPA'S RACT/BACT/LAER Clearing House (December 2009)

RBLCID	FACILITY NAME	COUNTY	STATE	PERMIT DATE	PROCESS NAME	Size	Control Device description	CASE-BY-CASE BASIS	Emission Limit	
AR-0057	TENASKA ARKANSAS PARTNERS, LP	LONOKE	AR	10/9/2001	BOILER, NATURAL GAS, (2)	122.00 MMBTU/H	FLUE GAS RECIRCULATION (FGR).	BACT-PSD	0.040 LB/MMBTU	
TX-0411	AMELIA ENERGY CENTER	JEFFERSON	TX	3/26/2002	BOILER, AUXILIARY, NATURAL GAS	155.00 mmbtu/h		BACT-PSD	0.040 LB/MMBTU	
MN-0062	HEARTLAND CORN PRODUCTS	SIBLEY	MN	12/22/2005	BOILER	198.00 MMBTU/H		BACT-PSD	0.040 LB/MMBTU	
SC-0049	SKYGEN	CHEROKEE	SC	12/2/1999	THREE NATURAL GAS FIRED BOILERS (UTILITY)	230.00 MMBTU/H	LOW NOX BURNERS WITH FLUE GAS RECIRCULATION AND GOOD COMBUSTIONPRACTICES	Other Case-by-Case	0.040 LB/MMBTU	
TX-0386	AMELLA ENERGY CENTER	JEFFERSON	TX	3/26/2002	AUXILIARY BOILER	155.00 MMBTU/H		Other Case-by-Case	0.040 LB/MMBTU	
ID-0015	J R SIMPLOT COMPANY - DON SIDING PLANT	POWER	ID	4/5/2004	BOILER, 175 MMBTU/H	175.00 MMBTU/H	LOW-NOX BURNER	RACT	0.040 LB/MMBTU	30-DAY ROLLING AVG
ID-0015	J R SIMPLOT COMPANY - DON SIDING PLANT	POWER	ID	4/5/2004	BOILER, 64 MMBTU/H	64.00 MMBTU/H	LOW-NOX BURNER	RACT	0.045 LB/MMBTU	CALCULATED, NOT PERMIT LIMIT
*NV-0049	HARRAH'S OPERATING COMPANY, INC.	CLARK	NV	8/20/2009	BOILER - UNIT IP04	16.70 MMBTU/H	LOW NOX BURNER	BACT-PSD	0.049 LB/MMBTU	
OK-0045	REDBUD POWER PLT	OK	OK	8/15/2001	BOILER, AUXILIARY	20.00 MMBTU/H	LOW NOX BURNERS	BACT-PSD	0.049 LB/MMBTU	
IA-0050	CARGILL-EDDYVILLE	MONROE	IA	4/22/1999	BOILER 7	182.10 MMBTU/H	LOW NOX BURNERS WITH FGR	BACT-PSD	0.050 LB/MMBTU	
NE-0024	CARGILL - BLAIR PLANT	WASHINGTON	NE	6/22/2004	BOILER D (NO. 21)	276.67 MMBTU/H	LOW NOX BURNERS AND INDUCED FLUE GAS RECIRCULATION AT 16%.	Other Case-by-Case	0.050 LB/MMBTU	
AL-0128	ALABAMA POWER COMPANY - THEODORE COGENERATION	MOBILE	AL	3/16/1999	BOILER	220.00 MMBTU/H	LNB AND FLUE GAS RECIRCULATION	BACT-PSD	0.053 LB/MMBTU	
TN-0153	WILLIAMS REFINING & MARKETING, L.L.C.	SHELBY	TN	4/3/2002	BOILER, NO. 10	180.00 MMBTU/H		BACT-PSD	0.060 LB/MMBTU	
FL-0251	OKEELANTA CORPORATION SUGAR MILL	PALM BEACH	FL	10/29/2001	BOILER, NATURAL GAS	211.00 MMBTU/H	LOW NOX BURNERS W/FLUE GAS RECIRCULATION AND GOOD COMBUSTION.	BACT-PSD	0.060 LB/MMBTU	
TX-0414	ATOFINA PETROCHEMICALS PORT ARTHUR COMPLEX	JEFFERSON	TX	4/22/1999	SUPPLEMENTAL BOILER	227.00 MMBTU/H	GOOD COMBUSTION PRACTICE	BACT-PSD	0.060 LB/MMBTU	
NE-0024	CARGILL - BLAIR PLANT	WASHINGTON	NE	6/22/2004	BOILERS A, B & C	198.00 MMBTU/H	LOW NOX BURNERS AND INDUCED DRAFT FLUE GAS RECIRCULATION	Other Case-by-Case	0.070 LB/MMBTU	

Table C-6 NO_x Emission Limits for Boilers <250 MMBtu/hr from EPA'S RACT/BACT/LAER Clearing House (December 2009)

RBLCID	FACILITY NAME	COUNTY	STATE	PERMIT DATE	PROCESS NAME	Size	Control Device description	CASE-BY-CASE BASIS	Emission Limit	
LA-0183	TITANIUM DIOXIDE FACILITY	CALCASIEU	LA	11/14/2003	BOILERS, UTILITY, D841-1X & D841-2X	135.00 MMBTU/H	LOW NOX BURNERS INCORPORATING OPTIMAL EXCESS AIR FIRING	BACT-PSD	0.074 LB/MMBTU	ANNUAL AVERAGE
VA-0278	VCU EAST PLANT	RICHMOND	VA	3/31/2003	BOILER, NATURAL GAS, (3)	150.60 MMBTU/H	LOW NOX BURNERS, FLUE GAS RECIRCULATION, AND GOOD OPERATING PROCEDURES	BACT-PSD	0.080 LB/MMBTU	annual avg
TN-0153	WILLIAMS REFINING & MARKETING, L.L.C.	SHELBY	TN	4/3/2002	BOILER, NO. 9	95.00 MMBTU/H		BACT-PSD	0.084 LB/MMBTU	
MS-0069	DUPONT DELISLE FACILITY	HARRISON	MS	6/8/2004	BOILER #3	231.00 MMBTU/H	LOW-NOX BURNER WITH FGR.	BACT-PSD	0.090 LB/MMBTU	
MS-0069	DUPONT DELISLE FACILITY	HARRISON	MS	6/8/2004	BOILER (RENTAL/TEMPORARY)	231.00 MMBTU/H	LOW-NOX BURNER WITH FGR.	BACT-PSD	0.090 LB/MMBTU	
WV-0023	MAIDSVILLE	MONONGAHELA	WV	3/2/2004	AUXILIARY BOILER	225.00 MMBTU/H	LOW NOX BURNERS AND GOOD COMBUSTION PRACTICES	BACT-PSD	0.098 lb/MMBtu	3 HOUR ROLLING AVERAGE
WI-0228	WPS - WESTON PLANT	MARATHON	WI	10/19/2004	AUXILLIARY NAT. GAS FIRED BOILER (B25, S25)	229.80 MMBTU/H	NATURAL GAS, GOOD COMBUSTION PRACTICES, LOW NOX BURNERS	BACT-PSD	0.100 lb/MMBtu	2000 H / 12 MO. ROLLING
VA-0270	VCU EAST PLANT	RICHMOND CITY	VA	3/31/2003	BOILER NATUAL GAS	150.00 MMBTU/H	GOOD COMBUSTION PRACTICES. LOW NOX COMBUSTION AND FGR. CEM SYSTEM.	BACT-PSD	0.100 LB/MMBTU	
WV-0015	E.I. DUPONT - WASHINGTON WORKS	WOOD	WV	1/2/2002	BOILER, NATURAL GAS, 181 MMBTU/H	181.00 MMBTU/H	BOILER USES LOW-NOX BURNERS, FLUE GAS RECIRCULATION AND COMBUSTION CONTROLS TO CONTROL NOX.	BACT-PSD	0.100 LB/MMBTU	
NC-0101	FORSYTH ENERGY PLANT	FORSYTH	NC	9/29/2005	AUXILLIARY BOILER	110.20 MMBTU/H	LOW-NOX BURNERS, GOOD COMBUSTION CONTROL AND CLEAN BURNING, LOW-SULFUR FUEL (NATURAL GAS).	BACT-PSD	0.137 LB/MMBTU	calculated
*OH-0310	AMERICAN MUNICIPAL POWER GENERATING STATION	MEIGS	OH	10/8/2009	AUXILIARY BOILER	150.00 MMBTU/H		BACT-PSD	0.140 LB/MMBTU	
PA-0170	SUNOCO INC. (R&M)	DELAWARE	PA	8/2/2001	BOILER #7	245.00 MMBTU/H	GAS FIRED, OPERATED AND MAINTAINED IN ACCORDANCE WITH MANUFACTURER'S SPECIFIACTIONS.	RACT	0.250 lb/MMBtu	24 HOUR BASIS
NJ-0042	ROCHE VITAMINS	WARREN	NJ	2/5/1999	BOILER 4 (NAT GAS)	118.00 MMBTU/H	NONE LISTED	BACT-PSD	0.280 LB/MMBTU	

Table C-6 NO_x Emission Limits for Boilers <250 MMBtu/hr from EPA'S RACT/BACT/LAER Clearing House (December 2009)

RBLCID	FACILITY NAME	COUNTY	STATE	PERMIT DATE	PROCESS NAME	Size	Control Device description	CASE-BY-CASE BASIS	Emission Limit
NJ-0042	ROCHE VITAMINS	WARREN	NJ	2/5/1999	BOILER 2 (NAT GAS)	134.00 MMBTU/H	NONE LISTED	BACT-PSD	0.280 LB/MMBTU
NJ-0042	ROCHE VITAMINS	WARREN	NJ	2/5/1999	BOILER 3 (NAT GAS)	152.00 MMBTU/H	NONE LISTED	BACT-PSD	0.280 LB/MMBTU
NJ-0042	ROCHE VITAMINS	WARREN	NJ	2/5/1999	BOILER 1 (NATURAL GAS)	84.40 MMBTU/H		BACT-PSD	0.400 LB/MMBTU
NJ-0042	ROCHE VITAMINS	WARREN	NJ	2/5/1999	BOILER 4 (NO. 2 OIL)	204.20 MMBTU/H	NONE LISTED	BACT-PSD	0.480 LB/MMBTU
NJ-0042	ROCHE VITAMINS	WARREN	NJ	2/5/1999	BOILER 3 (NO. 2 OIL)	241.60 MMBTU/H	NONE LISTED	BACT-PSD	0.480 LB/MMBTU
OH-0241	MILLER BREWING COMPANY - TRENTON	BUTLER	OH	5/27/2004	BOILER (2), NATURAL GAS	238.00 MMBTU/H	OVERFIRE AND SIDE FIRE AIR TO REDUCE FLAME TEMERATURE	BACT-PSD	0.700 LB/MMBTU

Table C-7 NO_x Emission Limits for Fuel Gas Heaters from EPA'S RACT/BACT/LAER Clearing House (December 2009)

RBLCID	FACILITY NAME	COUNTY	STATE	PERMIT DATE	PROCESS NAME	Size		Control Device description	CASE-BY-CASE BASIS	Emission Limit		
MD-0031	CHALK POINT	PRINCE GEORGES	MD	4/1/2005	(2) NATURAL GAS FUEL HEATERS	10.00	MMBtu/hr	LOW NOX BURNER TECHNOLOGY AND NATURAL GAS FIRING	BACT-PSD	0.010	lb/MMBtu	CALCULATED
MD-0036	DOMINION	CALVERT	MD	3/10/2006	FUEL GAS PROCESS HEATER			GOOD COMBUSTION PRACTICES AND DRY LNB	LAER	0.021	lb/MMBtu	CALCULATED
MD-0036	DOMINION	CALVERT	MD	3/10/2006	FUEL GAS PROCESS HEATER			DRY LNB AND GOOD COMBUSTION PRACTICES	BACT-PSD	0.021	lb/MMBtu	CALCULATED
CO-0058	CHEYENNE STATION	WELD	CO	6/12/2004	HEATERS	45.00	MMBtu/hr	LOW NOX BURNERS	BACT-PSD	0.035	lb/MMBtu	
NJ-0062	CONSOLIDATE EDISON DEVELOPMENT (CED)	OCEAN	NJ	10/22/2002	FUEL GAS HEATERS (3 UNITS)	4.62	MMBtu/hr	LOW NOX -COMBUSTOR	LAER	0.036	lb/MMBtu	
IA-0058	GREATER DES MOINES ENERGY CENTER	POLK	IA	4/10/2002	DEW POINT HEATER				BACT-PSD	0.036	lb/MMBtu	
IA-0058	GREATER DES MOINES ENERGY CENTER	POLK	IA	4/10/2002	EFFICIENCY HEATER				BACT-PSD	0.041	lb/MMBtu	
TX-0359	LIMESTONE ELECTRIC GENERATING STATION	LIMESTONE	TX	5/23/2001	HEATERS, H-8,H-60,H-42,H-43,H-61,H-63			NONE INDICATED	Other Case-by-Case	0.045	lb/MMBtu	1 H AV @ <= 90% FIRING RATE
IA-0068	EMERY GENERATING STATION	CERRO GORDO	IA	6/26/2003	GAS HEATER	9.00	MMBtu/hr	DLN	Other Case-by-Case	0.049	lb/MMBtu	
IA-0062	EMERY GENERATING STATION	CERRO GORDO	IA	12/20/2002	GAS HEATER, (2)	16.40	MMBtu/hr	DLN	Other Case-by-Case	0.049	lb/MMBtu	
IA-0060	HAWKEYE GENERATING, LLC	ADAIR	IA	7/23/2002	FUEL PREHEATER	6.50	MMBtu/hr	GCP	BACT-PSD	0.054	lb/MMBtu	
IA-0060	HAWKEYE GENERATING, LLC	ADAIR	IA	7/23/2002	FUEL PREHEATER	6.50	MMBtu/hr	GCP	BACT-PSD	0.054	lb/MMBtu	
OH-0264	NORTON ENERGY STORAGE, LLC	SUMMIT	OH	5/23/2002	FUEL SUPPLY HEATERS (9)	11.45	MMBtu/hr		BACT-PSD	0.094	lb/MMBtu	
IA-0063	WISDOM GENERATION STATION	CLAY	IA	2/5/2003	HEATER , NATURAL GAS	5.38	MMBtu/hr	DLN	Other Case-by-Case	0.095	lb/MMBtu	

Table C-7 NO_x Emission Limits for Fuel Gas Heaters from EPA'S RACT/BACT/LAER Clearing House (December 2009)

RBLCID	FACILITY NAME	COUNTY	STATE	PERMIT DATE	PROCESS NAME	Size		Control Device description	CASE-BY-CASE BASIS	Emission Limit		
FL-0303	FPL WEST COUNTY ENERGY CENTER UNIT 3	PALM BEACH COUNTY	FL	7/30/2008	TWO NOMINAL 10 MMBTU/H NATURAL GAS-FIRED PROCESS HEATERS	10.00	MMBtu/hr	GOOD COMBUSTION	BACT-PSD	0.095	lb/MMBtu	
FL-0286	FPL WEST COUNTY ENERGY CENTER	PALM BEACH	FL	1/10/2007	TWO GAS-FUELED 10 MMBTU/H PROCESS HEATERS	10.00	MMBtu/hr		BACT-PSD	0.095	lb/MMBtu	
MD-0040	CPV ST CHARLES	CHARLES	MD	11/12/2008	HEATER	1.70	MMBtu/hr		BACT-PSD	0.100	lb/MMBtu	
*WY-0064	DRY FORK STATION	CAMPBELL	WY	10/15/2007	INLET GAS HEATER (ES1-06)	8.36	MMBtu/hr	GOOD COMBUSTION PRACTICES-LIMITED TO 2000 HOURS OF ANNUAL OPERATION.	Other Case-by-Case	0.100	lb/MMBtu	ANNUAL
WI-0227	PORT WASHINGTON GENERATING STATION	WASHINGTON	WI	10/13/2004	GAS HEATER (P06, S06)	10.00	MMBtu/hr	NATURAL GAS FUEL	N/A	0.100	lb/MMBtu	
GA-0107	TALBOT ENERGY FACILITY	TALBOT	GA	6/9/2003	FUEL GAS PREHEATERS, (3)	5.00	MMBtu/hr	DRY LOW NOX BURNERS	BACT-PSD	0.110	lb/MMBtu	CALCULATED
NJ-0036	AES RED OAK LLC	MIDDLESEX	NJ	10/24/2001	FUEL GAS HEATER	16.00	MMBtu/hr	NONE- CONCLUDED THAT FUEL GAS HEATER HAS FAR LOWER HEAT INPUT RATE AND SUCH NOX CONTROLS ARE NOT PROBABLE BASED ON COST-EFFECTIVENESS	LAER	0.120	lb/MMBtu	
IN-0116	PSEG LAWRENCEBURG ENERGY CO., INC.	DEARBORN	IN	12/23/2002	HEATER, STARTUP GAS, NATURAL GAS	2.40	MMBtu/hr		BACT-PSD	0.140	lb/MMBtu	
NV-0035	TRACY SUBSTATION EXPANSION PROJECT	STOREY COUNTY	NV	8/16/2005	FUEL PREHEATER #1	4.00	MMBtu/hr	BEST COMBUSTION PRACTICES	BACT-PSD	0.140	lb/MMBtu	
NV-0035	TRACY SUBSTATION EXPANSION PROJECT	STOREY COUNTY	NV	8/16/2005	FUEL PREHEATER #2	4.00	MMBtu/hr	BEST COMBUSTION PRACTICES	BACT-PSD	0.140	lb/MMBtu	
*IA-0064	ROQUETTE AMERICA	LEE	IA	1/31/2003	DEW POINT HEATER	1.60	MMBtu/hr	GOOD COMBUSTION PRACTICES	BACT-PSD	0.150	lb/MMBtu	
GA-0105	MCINTOSH COMBINED CYCLE FACILITY	EFFINGHAM	GA	4/17/2003	FUEL GAS HEATER	5.00	MMBtu/hr		BACT-PSD	0.370	lb/MMBtu	CALCULATED

Table C-8 CO Emission Limits for Boilers <250 MMBtu/hr from EPA'S RACT/BACT/LAER Clearing House (December 2009)

RBLCID	FACILITY NAME	COUNTY	STATE	PERMIT DATE	PROCESS NAME	Size		Control Device description	CASE-BY-CASE BASIS	Emission Limit		
*NV-0049	HARRAH'S OPERATING COMPANY, INC.	CLARK	NV	8/20/2009	BOILER - UNIT CP01	35.40	MMBTU/H	OPERATING IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATION	Other Case-by-Case	0.028	LB/MMBTU	
OR-0040	KLAMATH GENERATION, LLC	KLAMATH	OR	3/12/2003	BOILER, AUXILIARY, NATURAL GAS	########	LB/H		BACT-PSD	0.035	LB/MMBTU	
NJ-0042	ROCHE VITAMINS	WARREN	NJ	2/5/1999	BOILER 1 (NATURAL GAS)	84.40	MMBTU/H	NONE LISTED	BACT-PSD	0.036	LB/MMBTU	
*NV-0049	HARRAH'S OPERATING COMPANY, INC.	CLARK	NV	8/20/2009	BOILER - UNIT HA08	8.37	MMBTU/H	OPERATING IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATION	Other Case-by-Case	0.037	LB/MMBTU	
*GA-0127	PLANT MCDONOUGH COMBINED CYCLE	COBB	GA	1/7/2008	AUXILLARY BOILERS	200.00	MMBTU/H		BACT-PSD	0.037	lb/MMBtu	3-HOUR
WV-0023	MAIDSVILLE	MONONGAHELA	WV	3/2/2004	AUXILIARY BOILER	225.00	MMBTU/H	GOOD COMBUSTION PRACTICES, USE OF NATURAL GAS	BACT-PSD	0.037	lb/MMBtu	3-HOUR
PA-0193	MERCK AND COMPANY - WEST POINT PLANT	MONTGOMERY	PA	8/26/1999	BOILER, NATURAL GAS, (2)	249.00	MMBTU/H	GOOD COMBUSTION PRACTICE	Other Case-by-Case	0.037	lb/MMBtu	
OR-0046	TURNER ENERGY CENTER, LLC	MARION	OR	1/6/2005	AUXILIARY BOILER	48.00	MMBTU/YR	OXIDATION CATALYST	BACT-PSD	0.038	LB/MMBTU	
NJ-0042	ROCHE VITAMINS	WARREN	NJ	2/5/1999	BOILER 4 (NAT GAS)	118.00	MMBTU/H	NONE LISTED	BACT-PSD	0.040	LB/MMBTU	
NJ-0042	ROCHE VITAMINS	WARREN	NJ	2/5/1999	BOILER 2 (NAT GAS)	134.00	MMBTU/H	NOT LISTED	BACT-PSD	0.040	LB/MMBTU	
NJ-0042	ROCHE VITAMINS	WARREN	NJ	2/5/1999	BOILER 3 (NAT GAS)	152.00	MMBTU/H	NONE LISTED	BACT-PSD	0.040	LB/MMBTU	
NJ-0042	ROCHE VITAMINS	WARREN	NJ	2/5/1999	BOILER 4 (NO. 2 OIL)	204.20	MMBTU/H	NONE LISTED	BACT-PSD	0.040	LB/MMBTU	
NJ-0042	ROCHE VITAMINS	WARREN	NJ	2/5/1999	BOILER 3 (NO. 2 OIL)	241.60	MMBTU/H	NONE LISTED	BACT-PSD	0.040	LB/MMBTU	
AR-0070	GENOVA ARKANSAS I, LLC	WASHINGTON	AR	8/23/2002	AUXILIARY BOILER	33.00	MMBTU/H	GOOD COMBUSTION PRACTICE	BACT-PSD	0.040	LB/MMBTU	
*AL-0230	THYSSENKRUPP STEEL AND STAINLESS USA, LLC	MOBILE	AL	8/17/2007	3 NATURAL GAS-FIRED BOILERS WITH ULNB & EGR (537-539)	64.90	MMBTU each		BACT-PSD	0.040	lb/MMBtu	
MN-0062	HEARTLAND CORN PRODUCTS	SIBLEY	MN	12/22/2005	BOILER	198.00	MMBTU/H		BACT-PSD	0.040	lb/MMBtu	
AR-0026	PINE BLUFF ENERGY LLC - PINE BLUFF ENERGY CENTER	JEFFERSON	AR	5/5/1999	BOILER, NATURAL GAS	362.00	MMBTU/H	GOOD COMBUSTION PRACTICES	BACT-PSD	0.044	LB/MMBTU	
NJ-0036	AES RED OAK LLC	MIDDLESEX	NJ	10/24/2001	AUXILIARY BOILER	120.00	MMBTU/H	GOOD COMBUSTION PRACTICE	BACT-PSD	0.050	LB/MMBTU	
SC-0049	SKYGEN	CHEROKEE	SC	12/2/1999	THREE NATURAL GAS FIRED BOILERS (UTILITY)	230.00	MMBTU/H	GOOD COMBUSTION AND CLEAN FUELS	Other Case-by-Case	0.060	LB/MMBTU	

Table C-8 CO Emission Limits for Boilers <250 MMBtu/hr from EPA'S RACT/BACT/LAER Clearing House (December 2009)

RBLCID	FACILITY NAME	COUNTY	STATE	PERMIT DATE	PROCESS NAME	Size		Control Device description	CASE-BY-CASE BASIS	Emission Limit		
TX-0414	ATOFINA PETROCHEMICALS PORT ARTHUR COMPLEX	JEFFERSON	TX	4/22/1999	SUPPLEMENTAL BOILER	227.00	MMBTU/H	GOOD COMBUSTION PRACTICE	BACT-PSD	0.070	LB/MMBTU	
*NV-0049	HARRAH'S OPERATING COMPANY, INC.	CLARK	NV	8/20/2009	BOILER - UNIT IP04	16.70	MMBTU/H	OPERATING IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATION	Other Case-by-Case	0.070	LB/MMBTU	
*ID-0017	POWER COUNTY ADVANCED ENERGY CENTER	POWER	ID	2/10/2009	250 MMBTU/H PACKAGE BOILER, SRC24	250.00	MMBTU/H	GOOD COMBUSTION PRACTICES	BACT-PSD	0.074	lb/MMBtu	
TX-0386	AMELLA ENERGY CENTER	JEFFERSON	TX	3/26/2002	AUXILIARY BOILER	155.00	MMBTU/H		Other Case-by-Case	0.080	LB/MMBTU	
LA-0193	STYRENE MONOMER PLANT	IBERVILLE	LA	2/11/2003	REHEATER HS-8220	195.00	MMBTU/H	GOOD COMBUSTION PRACTICES - GOOD EQUIPMENT DESIGN, USE OF GASEOUS FUELS FOR GOOD MIXING, AND PROPER COMBUSTION TECHNIQUES	BACT-PSD	0.080	LB/MMBTU	ANNUAL AVERAGE
MN-0066	NORTHERN STATES POWER CO. DBA XCEL ENERGY - RIVERSIDE PLANT	RAMSEY	MN	5/16/2006	BOILER, AUXILIARY, NATURAL GAS	160.00	mmbtu/h	GOOD COMBUSTION	BACT-PSD	0.080	LB/MMBTU	
WI-0228	WPS - WESTON PLANT	MARATHON	WI	10/19/2004	AUXILLIARY NAT. GAS FIRED BOILER (B25, S25)	229.80	MMBTU/H	NATURAL GAS, GOOD COMBUSTION PRACTICES, LOW NOX BURNER	BACT-PSD	0.080	LB/MMBTU	
TX-0414	ATOFINA PETROCHEMICALS PORT ARTHUR COMPLEX	JEFFERSON	TX	4/22/1999	DUCT BURNER (2)	317.00	MMBTU/H	GOOD COMBUSTION PRACTICE	BACT-PSD	0.080	LB/MMBTU	
OK-0045	REDBUD POWER PLT	OK	OK	8/15/2001	BOILER, AUXILIARY	20.00	MMBTU/H	GOOD OPERATING PRACTICE	BACT-PSD	0.082	LB/MMBTU	
IN-0085	PSEG LAWRENCEBURG ENERGY FACILITY	DEARBORN	IN	6/7/2001	AUXILIARY BOILER, NATURAL GAS	124.60	MMBTU/H	GOOD COMBUSTION. NATURAL GAS ONLY	BACT-PSD	0.082	LB/MMBTU	
NC-0101	FORSYTH ENERGY PLANT	FORSYTH	NC	9/29/2005	AUXILLIARY BOILER	110.20	MMBTU/H	LOW-NOX BURNERS, GOOD COMBUSTION CONTROL AND CLEAN BURNING, LOW-SULFUR FUEL (NATURAL GAS).	BACT-PSD	0.082	LB/MMBTU	calculated
OH-0241	MILLER BREWING COMPANY - TRENTON	BUTLER	OH	5/27/2004	BOILER (2), NATURAL GAS	238.00	MMBTU/H		BACT-PSD	0.084	LB/MMBTU	
*OH-0310	AMERICAN MUNICIPAL POWER GENERATING STATION	MEIGS	OH	10/8/2009	AUXILIARY BOILER	150.00	MMBTU/H		BACT-PSD	0.084	LB/MMBTU	calculated based on lb/hr

Table C-8 CO Emission Limits for Boilers <250 MMBtu/hr from EPA'S RACT/BACT/LAER Clearing House (December 2009)

RBLCID	FACILITY NAME	COUNTY	STATE	PERMIT DATE	PROCESS NAME	Size		Control Device description	CASE-BY-CASE BASIS	Emission Limit		
NJ-0043	LIBERTY GENERATING STATION	UNION	NJ	3/28/2002	AUXILIARY BOILER	200.00	MMBTU/H	CO CATALYST	Other Case-by-Case	0.087	LB/MMBTU	
TN-0153	WILLIAMS REFINING & MARKETING, L.L.C.	SHELBY	TN	4/3/2002	BOILER, NO. 9	95.00	MMBTU/H		BACT-PSD	0.090	LB/MMBTU	
LA-0184	TITANIUM DIOXIDE FACILITY	CALCASIEU	LA	5/13/2003	UTILITY BOILERS D841-1X & D841-2X (135 MM BTU/H EA.)	135.00	MMBTU/H	GOOD EQUIPMENT DESIGN AND PROPER COMBUSTION TECHNIQUES	BACT-PSD	0.091	LB/MMBTU	ANNUAL AVERAGE
NJ-0043	LIBERTY GENERATING STATION	UNION	NJ	3/28/2002	DUCT BURNER (3)	256.00	MMBTU/H	CO CATALYST	Other Case-by-Case	0.096	LB/MMBTU	
VA-0270	VCU EAST PLANT	RICHMOND CITY	VA	3/31/2003	BOILER NATUAL GAS	150.00	MMBTU/H	GOOD COMBUSTION PRACTICES.	BACT-PSD	0.100	LB/MMBTU	
VA-0278	VCU EAST PLANT	RICHMOND	VA	3/31/2003	BOILER, NATURAL GAS, (3)	150.60	MMBTU/H	GOOD COMBUSTION PRACTICE	BACT-PSD	0.100	LB/MMBTU	calculated
AR-0057	TENASKA ARKANSAS PARTNERS, LP	LONOKE	AR	10/9/2001	BOILER, NATURAL GAS, (2)	122.00	MMBTU/H	GOOD COMBUSTION PRACTICES.	BACT-PSD	0.110	LB/MMBTU	
*NV-0049	HARRAH'S OPERATING COMPANY, INC.	CLARK	NV	8/20/2009	BOILER - UNIT PA15	21.00	MMBTU/H	OPERATING IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATION	Other Case-by-Case	0.111	LB/MMBTU	
NE-0024	CARGILL - BLAIR PLANT	WASHINGTON	NE	6/22/2004	BOILER D (NO. 21)	276.67	MMBTU/H	GOOD COMBUSTION PRACTICES	Other Case-by-Case	0.140	LB/MMBTU	
AL-0128	ALABAMA POWER COMPANY - THEODORE COGENERATION	MOBILE	AL	3/16/1999	BOILER	220.00	MMBTU/H	EFFICIENT COMBUSTION	BACT-PSD	0.165	LB/MMBTU	
TN-0153	WILLIAMS REFINING & MARKETING, L.L.C.	SHELBY	TN	4/3/2002	BOILER, NO. 10	180.00	MMBTU/H		BACT-PSD	0.180	LB/MMBTU	

Table C-9 CO Emission Limits for Fuel Gas Heaters from EPA'S RACT/BACT/LAER Clearing House (December 2009)

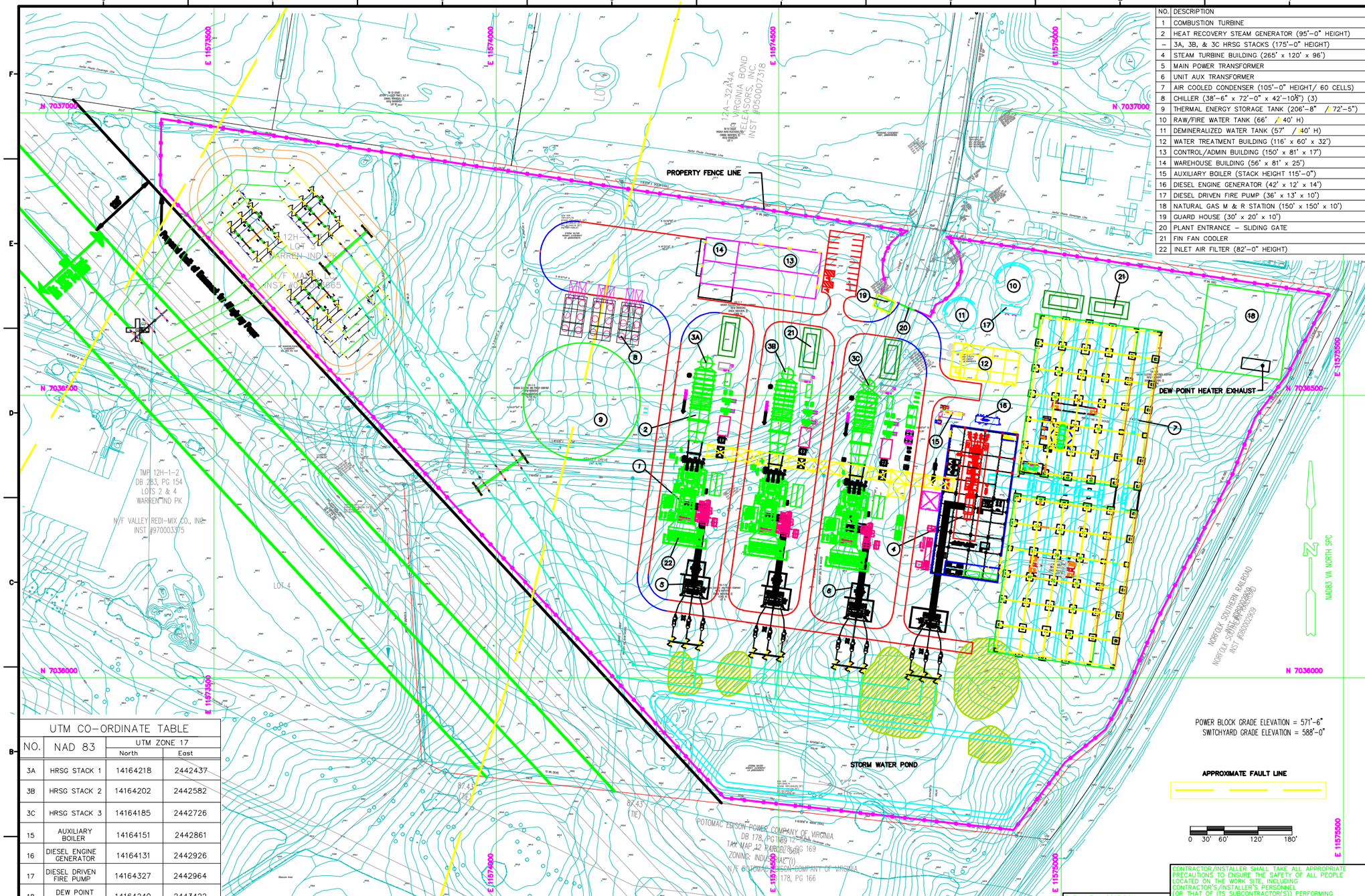
RBLCID	FACILITY NAME	COUNTY	STATE	PERMIT DATE	PROCESS NAME	Size		Control Device description	CASE-BY-CASE BASIS	Emission Limit	
GA-0107	TALBOT ENERGY FACILITY	TALBOT	GA	6/9/2003	FUEL GAS PREHEATERS, (3)	5.00	MMBtu/hr	GOOD COMBUSTION PRACTICE	BACT-PSD	0.0220	lb/MMBtu
NV-0035	TRACY SUBSTATION EXPANSION PROJECT	STOREY COUNTY	NV	8/16/2005	FUEL PREHEATER #1	4.00	MMBtu/hr	BEST COMBUSTION PRACTICES	BACT-PSD	0.0300	lb/MMBtu
NV-0035	TRACY SUBSTATION EXPANSION PROJECT	STOREY COUNTY	NV	8/16/2005	FUEL PREHEATER #2	4.00	MMBtu/hr	BEST COMBUSTION PRACTICES	BACT-PSD	0.0300	lb/MMBtu
IA-0058	GREATER DES MOINES ENERGY CENTER	POLK	IA	4/10/2002	EFFICIENCY HEATER		MMBtu/hr		BACT-PSD	0.0320	lb/MMBtu
IA-0060	HAWKEYE GENERATING, LLC	ADAIR	IA	7/23/2002	FUEL PREHEATER	6.50	MMBtu/hr	GCP	BACT-PSD	0.0330	lb/MMBtu
IA-0060	HAWKEYE GENERATING, LLC	ADAIR	IA	7/23/2002	FUEL PREHEATER	6.50	MMBtu/hr	GCP	BACT-PSD	0.0330	lb/MMBtu
IA-0058	GREATER DES MOINES ENERGY CENTER	POLK	IA	4/10/2002	DEW POINT HEATER		MMBtu/hr		BACT-PSD	0.0360	lb/MMBtu
CO-0058	CHEYENNE STATION	WELD	CO	6/12/2004	HEATERS	45.00	MMBtu/hr	GOOD COMBUSTION PRACTICES	BACT-PSD	0.0370	lb/MMBtu
WI-0227	PORT WASHINGTON GENERATING STATION	WASHINGTON	WI	10/13/2004	GAS HEATER (P06, S06)	10.00	MMBtu/hr	NATURAL GAS FUEL	BACT-PSD	0.0470	lb/MMBtu
NJ-0036	AES RED OAK LLC	MIDDLESEX	NJ	10/24/2001	FUEL GAS HEATER	16.00	MMBtu/hr	GOOD COMBUSTION PRACTICE	BACT-PSD	0.0538	lb/MMBtu
WI-0195	SENA NIAGARA MILL	MARINETTE	WI	10/18/2002	PROCESS HEATER, PAPER MACHINE P51	34.40	MMBtu/hr	ANY NEW (REPLACEMENT) IR BURNERS WILL BE LOW NOX BURNERS, FIRING NATURAL GAS	BACT-PSD	0.0600	lb/MMBtu
LA-0192	CRESCENT CITY POWER	ORLEANS	LA	6/6/2005	FUEL GAS HEATERS (3)	19.00	MMBtu/hr	GOOD COMBUSTION PRACTICES	BACT-PSD	0.0800	lb/MMBtu
*WY-0064	DRY FORK STATION	CAMPBELL	WY	10/15/2007	INLET GAS HEATER (ES1-06)	8.36	MMBtu/hr	GOOD COMBUSTION PRACTICES-LIMITED TO 2000 HOURS OF ANNUAL OPERATION.	Other Case-by-Case	0.0800	lb/MMBtu
MD-0040	CPV ST CHARLES	CHARLES	MD	11/12/2008	HEATER	1.70	MMBtu/hr		BACT-PSD	0.0800	lb/MMBtu
FL-0303	FPL WEST COUNTY ENERGY CENTER UNIT 3	PALM BEACH COUNTY	FL	7/30/2008	TWO NOMINAL 10 MMBTU/H NATURAL GAS-FIRED PROCESS HEATERS	10.00	MMBtu/hr	GOOD COMBUSTION	BACT-PSD	0.0800	lb/MMBtu
FL-0286	FPL WEST COUNTY ENERGY CENTER	PALM BEACH	FL	1/10/2007	TWO GAS-FUELED 10 MMBTU/H PROCESS HEATERS	10.00	MMBtu/hr		BACT-PSD	0.0800	lb/MMBtu

Table C-9 CO Emission Limits for Fuel Gas Heaters from EPA'S RACT/BACT/LAER Clearing House (December 2009)

RBLCID	FACILITY NAME	COUNTY	STATE	PERMIT DATE	PROCESS NAME	Size		Control Device description	CASE-BY-CASE BASIS	Emission Limit	
FL-0285	PROGRESS BARTOW POWER PLANT	PINELLAS	FL	1/26/2007	FIVE 3 MM BTU/HR GASEOUS-FUELED PROCESS HEATERS	3.00	MMBtu/hr		BACT-PSD	0.0800	lb/MMBtu
IA-0068	EMERY GENERATING STATION	CERRO GORDO	IA	6/26/2003	GAS HEATER	9.00	MMBtu/hr	GOOD COMBUSTION PRACTICES	Other Case-by-Case	0.0820	lb/MMBtu
IA-0062	EMERY GENERATING STATION	CERRO GORDO	IA	12/20/2002	GAS HEATER, (2)	16.40	MMBtu/hr		Other Case-by-Case	0.0820	lb/MMBtu
GA-0105	MCINTOSH COMBINED CYCLE FACILITY	EFFINGHAM	GA	4/17/2003	FUEL GAS HEATER	5.00	MMBtu/hr		BACT-PSD	0.0830	lb/MMBtu
LA-0184	TITANIUM DIOXIDE FACILITY	CALCASIEU	LA	5/13/2003	OXYGEN SUPERHEATERS W340-AX & W340-BX (5.61 MM BTU/H EA.)	5.61	MMBtu/hr	GOOD EQUIPMENT DESIGN AND PROPER COMBUSTION TECHNIQUES	BACT-PSD	0.0910	lb/MMBtu
MD-0031	CHALK POINT	PRINCE GEORGES	MD	4/1/2005	(2) NATURAL GAS FUEL HEATERS	10.00	MMBtu/hr	GOOD COMBUSTION CONTROL AND NATURAL GAS FIRING ONLY	BACT-PSD	0.1000	lb/MMBtu
NJ-0062	CONSOLIDATE EDISON DEVELOPMENT (CED)	OCEAN	NJ	10/22/2002	FUEL GAS HEATERS (3 UNITS)	4.62	MMBtu/hr	GOOD COMBUSTION PRACTICE	Other Case-by-Case	0.1500	lb/MMBtu

Appendix D

Plot Plan



NO.	DESCRIPTION
1	COMBUSTION TURBINE
2	HEAT RECOVERY STEAM GENERATOR (95'-0" HEIGHT)
–	3A, 3B, & 3C HRSG STACKS (175'-0" HEIGHT)
4	STEAM TURBINE BUILDING (265' x 120' x 96')
5	MAIN POWER TRANSFORMER
6	UNIT AUX TRANSFORMER
7	AIR COOLED CONDENSER (105'-0" HEIGHT/ 60 CELLS)
8	CHILLER (38'-6" x 72'-0" x 42'-10½") (3)
9	THERMAL ENERGY STORAGE TANK (206'-8" ⌀ 72'-5")
10	RAW/FIRE WATER TANK (66' ⌀ 40' H)
11	DEMINERALIZED WATER TANK (57' ⌀ 40' H)
12	WATER TREATMENT BUILDING (116' x 60' x 32')
13	CONTROL/ADMIN BUILDING (150' x 81' x 17')
14	WAREHOUSE BUILDING (56' x 81' x 25')
15	AUXILIARY BOILER (STACK HEIGHT 115'-0")
16	DIESEL ENGINE GENERATOR (42' x 12' x 14')
17	DIESEL DRIVEN FIRE PUMP (36' x 13' x 10')
18	NATURAL GAS M & R STATION (150' x 150' x 10')
19	GUARD HOUSE (30' x 20' x 10')
20	PLANT ENTRANCE – SLIDING GATE
21	FIN FAN COOLER
22	INLET AIR FILTER (82'-0" HEIGHT)

UTM CO-ORDINATE TABLE

NO.	NAD 83	UTM ZONE 17 North	UTM ZONE 17 East
3A	HRSG STACK 1	14164218	2442437
3B	HRSG STACK 2	14164202	2442582
3C	HRSG STACK 3	14164185	2442726
15	AUXILIARY BOILER	14164151	2442861
16	DIESEL ENGINE GENERATOR	14164131	2442926
17	DIESEL DRIVEN FIRE PUMP	14164327	2442964
18	DEW POINT HEATER	14164240	2443422

CONTRACTOR/INSTALLER SHALL TAKE ALL APPROPRIATE PRECAUTIONS TO ENSURE THE SAFETY OF ALL PEOPLE LOCATED ON THE WORK SITE, INCLUDING CONTRACTOR'S/INSTALLER'S PERSONNEL (OR THAT OF ITS SUBCONTRACTOR(S)) PERFORMING THE WORK.

FILENAME: M-006B.DGN

DRAWING RELEASE RECORD

REV.	DATE REL'D.	PREPARED	REVIEWED	APPROVED	PURPOSE
A	10/16/2009	R. MILLER	J. G. GATZ		FOR AIR MODELING
B	10/23/2009	R. MILLER	J. G. GATZ		FOR AIR MODELING
C	10/29/2009	R. MILLER	J. G. GATZ		FOR AIR MODELING
D	11/12/2009	R. MILLER	J. G. GATZ		FOR AIR MODELING

SCALE: 1" = 60'

PROJECT NUMBER: 12388-002

PRELIMINARY GENERAL ARRANGEMENT MHI 501G1 COMBINED CYCLE 3x3x1 DOMINION WARREN COUNTY

Sargent & Lundy LLC

DRAWING NO. M-006 REV. D

SHEET OF

Appendix E

Site-Specific Adjustment to Land Use for AERSURFACE Modeling

Pending VA DEQ's approval of the emission sources' emission rates and stack parameters, the air dispersion modeling for the project will be finalized, and Sections 6 – 10 and Appendices E- G will be provided as an addendum to Revision 2 of this application.

Appendix F

Air Dispersion Modeling Files

Pending VA DEQ's approval of the emission sources' emission rates and stack parameters, the air dispersion modeling for the project will be finalized, and Sections 6 – 10 and Appendices E- G will be provided as an addendum to Revision 2 of this application.

Appendix G

Background Emission Inventory

Pending VA DEQ's approval of the emission sources' emission rates and stack parameters, the air dispersion modeling for the project will be finalized, and Sections 6 – 10 and Appendices E- G will be provided as an addendum to Revision 2 of this application.